[From Galen: De Simplicium, Venice, 1625.]

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POETRY AND PHYSIC*

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THE present is perhaps not an inappropriate time to consider the relations between poetry and physic, for less than a year ago (on October 23, 1924) we celebrated the eightieth birthday of Dr. Robert Bridges, Poet Laureate since 1913 and the only medical man among the eighteen holders of the office of Versificator Regis, dating from Edmund Spenser in 1591. The nearest approach to a medical laureate was Robert Southey, who for a time was a medical student; he was the author of "The Doctor" and was appointed in 1813, just a hundred years before our Laureate, who dutifully wrote "Carmen elegiacum de Nosocomio sancti Bartolomaei Londinensi," 1877, with its thumb-nail portraits of its staff, and forty years later gave an address with the compelling title "The Necessity of Poetry" in which he showed that poetry, morals and religion "all spring from those universal primary emotions of man's spirit, which lead us naturally towards Beauty and Truth."

Newcastle upon Tyne too has its medical poets, for Mark Akenside (1721–1770), after deserting the prospect of the pulpit for the pill-box, composed his successful didactic poem, "The Pleasures of the Imagination," in this, his native, town before leaving for London and dropping the pursuit of "the draggle-tailed muses" to quote the words of a greater medical poet, Oliver Goldsmith. Thomas Trotter (1760–1832) after a rather turbulent career as a surgeon in the Royal Navy (1779–1802) retired to Newcastle upon Tyne a disappointed man, and in 1829 published a volume perhaps modestly entitled "Sea-weeds, Poems Written on Various Occasions, Chiefly during a Naval Life," and thus, as sometimes happens to medical men, returned to the poetic activity of early youth, for in 1777–1778, when a student, he published some verses in the *Edinburgh Magazine*. There must surely be some subtle influence in the Tyneside air stimulating the delivery of poetic offspring.

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* Opening address on October 6, 1925, at the College of Medicine, University of Durham.

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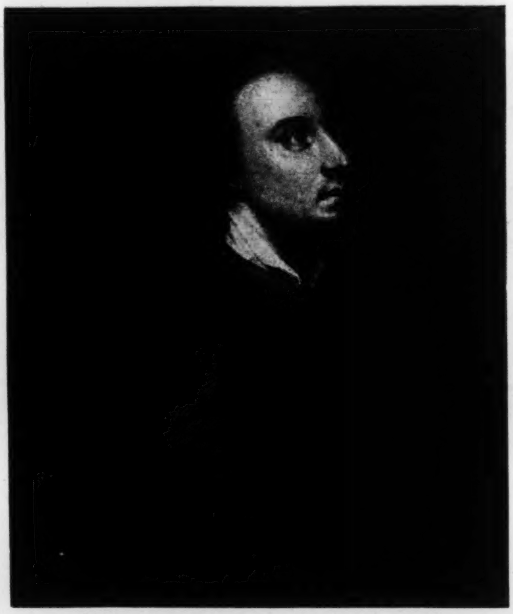
On grounds of ancient heredity poetry and physic should be closely allied, for Apollo, the god of poetry and culture, was the father of Aesculapius, the tutelary divinity of the healing art, and those who practiced medicine were dignified as "the children of Apollo." In the time of the Renaissance of learning, medicine was one of the several branches of knowledge coming within the purview of a philosophic scholar, and these were the days of the scholar-physicians such as Linacre. The relations between literature and medicine form an interesting episode in the history of letters, but the connection has of necessity become less intimate with the advance and increasing specialization of knowledge and technique. Even in the experience of those now living it seems to some that poetry, in spite of the volumes of Georgian verse, has less appeal and is less read than in Victorian times. In his recent poem, "The Spirit of Happiness," Lord Gorell sadly reflects that "the altars of Apollo, sovereign lord of poetry and still the source of all beauty, have fallen much into neglect in an age when Hephaitos, the spirit of machinery, reigns triumphant over all men's minds":



Mark Akenside, M.D., F.R.S. (1721–1770).

> And thou, Apollo, like a star bedimmed
> Within the sky's cloud caverns, watchest afar
> In unaccounted silent majesty.

According to Arnold Bennett, not one literary man in ten reads poetry knowingly, though he will enjoy it concealed in prose; but "show him a page of verse, and he will be ready to send for the policeman." We, the children of Apollo, whom J. W. Ballantyne called the "remakers" in contrast to "the makers" or poets, should therefore consider our pious attitude to our distant progenitor in order to decide if we are acting in the way best for our happiness and comfort. This country has the finest legacy of poetical literature in the world and the Great War called forth an outpouring of verse unparallelled since Elizabethan days, but do we all take full advantage of our opportunities?

Some years ago the idea struck me that it would be interesting to collect the works of medical men who were also poets; for our profession provides ample opportunity for observing man and his manners, women and their woes, human nature and its nakedness, and the beginnings, ends, and tragedies of our fellows. Such a hobby is attractive for the light it throws on the personalities of the past and for the pictures of eminent physicians, such as Sir Henry Halford composing elegant Latin verse ("Nugae Metricae," 1842) as he drove from one noble sick room to another, Sir Richard Blackmore, the opponent and victim of the wits, rolling out his eternal epics "to the rumbling of his coach's wheels," and thus contrasting with the humbler practitioner, John Mason Good (1764–1827), translating Lucretius into blank verse as he trudged through the London streets to do his practice; this literary task, conscientiously undertaken for his mental education, occupied six years. But I had barely started, when Dr. C. L. Dana of New York kindly sent me the charming catalogue of his collection of poetical works written by medical men, which, covering a period of two thousand years and containing 157 names and 295 works, compelled admiring interest while defying competition.

The subject of medicine and literature has often been the subject of addresses and articles, and I would specially refer to Sir Edmund Gosse's brilliant Lloyd Roberts Lecture (1923) on "The Personal Relations between Literature and Medicine" to which I am much indebted. In 1669 the distinguished Dutch anatomist, Thomas Bartholinus, published a small work of 149 pages, "De Medicis Poetis," Copenhagen; Broeck in his "Dissertation sur les médecins-poètes belges" arranges fifty of his countrymen in alphabetical order; and Achille Chereau in his "Parnasse médical français ou dictionnaire des médecins-poètes de la France, anciens ou modernes, morts ou vivants, etc.," Paris, 1874, gives in alphabetical order no less than 479 names, but modestly says that France cannot put forward any competitors to the poet-physicians who are mentioned in order, presumably of merit: Francesco Redi, Bellini, Blackmore, Haller, Akenside, Grainger, Darwin, Armstrong, Garth and others. In his scholarly introduction Dana passes in review the medical poets from classical times; from Empedocles (B.C. 500) and the times when the theriaka or panacea for all poisons was a favorite subject for the verses of Nicander, Andromachus and Macer Floridus, up to the present day. There is perhaps room for an anthology of medical poets; there is a collection, "College Lays" (1886), of eighty-one songs and verses by eight medical members of the Aesculapian, Medico-Chirurgical and other professional clubs in Edinburgh, which brim over with the humor and conviviality of the contributors, Dr. Andrew Wood, Sir Douglas Maclagan, Dr. J. D. Gillespie and Sir John Batty Tuke.

USES OF POETRY

Defined as articulate music by John Dryden, poetry is essentially imaginative and spontaneously translates experience into language of a special kind, not that of straightforward or even of rhymed prose, but imbued, as Lascelles Abercromby says, with the power "to kindle our minds into unusual vitality"; it is indeed an incantation or inspiration vividly revealing the poet's mental experiences, calling up an illusion of unexpected passionate existence and interpreting life in its highest sense. Poetry is to prose what a great painter's masterpiece is to an ordinary photograph. It is eminently creative; medicine, though similarly constructive in its curative and older function, has as its highest aim the prevention of disease and therefore, like the police, plays the rather negative part of eliminating the factors responsible for disorder and destruction. But in their different ways scientific medicine and poetry both aim at the attainment and perpetuation of the good, the beautiful and the true. Medicine touches life in every phase, but most obviously in its material aspects; poetry "binds together by passion and knowledge the vast empire of human society" (Wordsworth), applies noble ideas to life, and is especially idealistic. The greatest poets, such as Shakespeare, Dante and Keats, were concerned with the whole range of man's activities and imagination, and that the "miriad-minded" bard of Avon had a marvellous knowledge and was a master of

DR. THOMAS TROTTER AT THE AGE OF THIRTY-SEVEN.

medicine has been proved by Sir St. Clair Thomson's careful analysis. Though it is not always recognized, poetry has a most practical bearing on our work-a-day world by increasing the joy of existence. With their realistic and idealist sides medicine and poetry are complementary, and certainly poetry provides a relief from the ugliness and drabness of life. It is perhaps for this reason that the poets who most appeal to our profession, at least to the generation now passing into retirement and "the sere, the yellow leaf," are those dealing with the ethical and philosophical aspects of existence such as Shakespeare, Wordsworth, Shelley, Arnold, Clough and Emerson.

Sir Henry Halford, Bart., g.c.h., m.d., f.r.s. (1766–1844), president of the Royal College of Physicians of London, 1820–1844. (From a portrait by Sir Thomas Lawrence in the Royal College of Physicians of London.)

No doubt the idealism of the poet's eye "in a fine frenzy rolling," so remote from the sordid material details of fleshy infirmity, would appear to form an insuperable gulf between him and the physician. But each of those concerned with these contrasted aspects of life may gain by adopting coloring derived from the other. To the poet, Terence's maxim, now taken by the London Hospital as its motto: "Homo sum; humani nihil a me alienum puto," especially applies, and the philosophic curiosity in the mysteries of the human mechanism which attracted Coleridge, Southey and others to the study of medicine did not impair their poetic efficiency. Without attempting an estimate of how much it influenced their message, it may be conceded that the training in observation and in ordered method, and acquaintance with human tears and tragedies as seen within a hospital's walls cannot have been without a broadening influence.

Medical men, however, are probably more likely to gain by the culture and wide vistas opened by poetry and letters than are poets by a scientific or medical training. In his "Essays in Criticism" Matthew Arnold indeed insisted that without poetry science would be incomplete. Poetry implies spontaneity and imagination, which should not degenerate into poetic license; and imagination or the creative faculty is a form of divination or, in Professor H. E. Armstrong's words, "scientific second sight," which is of the greatest importance in medicine. Indeed according to Sir Clifford Allbutt the responsibility of a university is confined to ensuring a certain development of mind and imagination in its graduates. Imagination is a necessary stimulus to really good work and, especially in original research, it is as essential as is the cold logical sense of proportion which controls within proper bounds the investigations thus inspired, for it is the most fruitful initiative to lines of painstaking and laborious investigation. That familiarity with good poetry should improve a medical man's literary style is so obvious that one example only will be cited, and that from holy writ: St. Luke, the beloved physician, was, according to Miss Melian Stawell, a Roman and not, as is perhaps generally thought, a Greek,[1] and modelled his style in the Gospel and Acts of the Apostles on Virgil.

Therapeutic Uses of Poetry. Like music, poetry of course has an effect on the mind and the finer forms exert a powerful influence for good. Robert Graves says: "A well-chosen anthology is a complete dispensary of medicine for the more common mental disorders and may be used as much for prevention as cure." There can be little doubt of the value of poetry as a relief to the mental fatigue caused by the monotony and squalor of life such as we often see it; but it is possible that Mr. Robert Lynd is right in reproaching us for neglecting its psychotherapeutic uses when he says that we "are more accustomed to advising people to eat lettuces than to read poetry," and that in view of our silence Mr. Graves is justified in advocating the medical applications of poetry "in a passage that reads like a page of Aristotle seen through the spectacles of Dr. Freud." For Graves suggests that as poetry is the transformation into dream symbolism of some disturbing emotional crisis in the poet's mind, it is able to help, in a homeopathic fashion, other men similarly affected, by supplying an allegorical solution of the trouble. Not only may reading poetry soothe the jangled nerves of a jaded laborer and provide an antidote and antacid to the mental hyperchlorhydria born of the too material and stereotyped formulae of Medicine, but active composition of verse is a means of relieving the overburdened mind by providing a safe outlet for emotional excitement.

The valuable property of "clinical instinct" which, although sometimes ridiculed as the assumed armor and decoration of the ignoramus or the quack, has a certain resemblance to the poetic faculty, and moreover is a real asset in practice. Clinical instinct is the power of arriving without a conscious logical process at a definite conclusion, and is often possessed in a high degree by old nurses who know, but cannot give their reasons, whether a patient is going to recover or die, and by practitioners of long experience who similarly cannot explain the steps by which they reach a diagnosis and prognosis. It may be assumed that they unwittingly draw on a buried experience which, without their conscious remembrance, recognizes in the patient signs presented by one in the long past. In diagnosis, therefore, there are the two processes, the consciously logical and the rarer, but not necessarily less correct, unconscious.

In the writing of poetry there are also these two methods, the conscious effort and the impulsive pouring out pell mell of verse, the meaning of which, though quite clear to others, may not at the time be obvious to the writer. The most famous example of this is S. T. Coleridge, who after three hours in a profound sleep, at least of the external sense, during which he was confident he composed at least two or three hundred lines, awoke and eagerly wrote down the fifty-four lines of "Kubla Khan," but was then interrupted and to his mortification found that the remainder "had passed away like the images on the surface of a stream into which a stone had been cast." Other examples are to be found in John Bunyan's "Author's Apology for his Book" ("The Pilgrim's Progress"), and in Robert Burn's "First Epistle to Davie":

> The words come skelping, rank and file,
> Amaist before I ken.

Many poets of his acquaintance, says Robert Graves, "feel on laying down their pens after the first excitement of composition, the same surprise that a man finds on waking from a 'fugue,' and discover that they have done a piece of work of which they never suspected that they were capable."

Poetry as a means of communicating knowledge. The prolific multiplication of books by printing has rendered the transmission of knowledge so easy that it has led to the conviction that prose is the only proper method of conveying technical knowledge; but of course it was not ever thus. In early times, medical, like other, lore was largely handed down in the form, convenient for memory, of verse. In the past the famous "Regimen Sanitatis" of Salerno (A.D. 1100? and an early printed book in 1480) was the most popular poem in medical literature; up to 1835 there were 119 editions of the Latin text, 33 German translations, 14 French, 9 English, 9 Italian. As recently as 1920 an edition of Sir John Harington's English version was published. It was much in request as a handbook of domestic medicine, and, as was so frequent in the days before printed books, became much altered in the course of many copyings, successive scribes adding at their own discretion or indiscretion. Thus the early copies contained about 360 lines and the later ones over 1000. It ends with the benediction:

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[1] Since this address was delivered the Reverend J. W. Hunkin of Caius College, Cambridge, has warned me that the linguistic argument on which this opinion mainly depends is not convincing, and that parallels to the Latin constructions in St. Luke's writings are found in the Hellenistic Greek of the period.

And ye our Physicke rules that friendly read
God grant that Physicke you may never need.

ERASMUS DARWIN, M.D., F.R.S., AUTHOR OF "THE LOVES OF THE PLANTS."

Gilles de Corbeil, archiater to King Philip Augustus (1180–1223), clad his medical works in a poetic form and thus broadcasted the Salernitan tradition. Johann Joachim's "Parnassus Medicinalis" (1663) written in the style of the "Regimen" was, according to Dana, notable as the first systematic exploitation of opotherapy, and details the application of twenty-four substances in man's body useful in medicine. Next in popular importance to the "Regimen Sanitatis Salerni" the late Sir William Osler placed Girolamo Fracastoro's "Syphilis sive Morbus Gallicus" (1530) which gave us the name of a disease, the etiological importance of which it is even now difficult to estimate. David Kynalock (born 1560) was Scotland's chief Latin medical poet, being the author of a work in two volumes, "De hominis procreatione anatome ac morbis internis" (1596). Another Scot, John Armstrong (1709–1779), produced "The Famous Art of Preserving Health" (1744) a didactic poem in four books, which with its personal appeal naturally had a great vogue; his earlier and unpleasant effusion published anonymously in 1736, "The Economy of Love," has been euphemistically described as more creditable to his honesty than to his tact or delicacy, and more graphically as "hymning the praise of Venus in strains so warm that they dissolved away his practice." Erasmus Darwin's "Botanic Garden" in two parts: "The Economy of Vegetation" and "Loves of the Plants," (1790) was a didactic scientific poem. In recent years Mr. Alfred Noyes, who is not a medical man, following the example of Lucretius (B.C. 99–54) in "De rerum natura," has in his epic, "The Torch Bearers," described science and triumphantly shown to the lay reviewer that it is more readable and attractive in poetical dress than in its accustomed prose.

CAN A DOCTOR BE A POET?

Few, at any rate in the recent past, have at the same time been equally distinguished as medical men and writers of poetry.

Probably the best instances are the two Americans, Oliver Wendell Holmes (1809–1894), sometimes called the American Oliver Goldsmith, professor of anatomy for forty-four years, and S. Weir Mitchell (1829–1914), the neurologist of Philadelphia. It may not be out of place to quote four lines of Weir Mitchell's welcome to O. W. Holmes' portrait on its presentation to the College of Physicians of Philadelphia:

> The poet's rank thy title here completes,
> Doctor and Poet—so were Goldsmith—Keats;
> The voices failing, murmur to an end,
> With "Welcome Doctor, Poet, Friend."

This association, however, has been so rare that it has even been asked "Can a doctor be a poet?" and, with a wider application, "Is there any inherent incompatibility between the lancet and the lyre?" Thomas Denman (1733–1815), the obstetrician, in a letter to comfort his former pupil "The famous old Bath physician," as Osler called Caleb Hillier Parry, for the tardy advent of patients during his early years of practice, touched on the perennial problem why one medical man succeeds while another fails, remarking: "What is very hard, and I know two or three instances of it, is that a man shall be esteemed as a friend, acknowledged to be a man of parts, but none of his friends thinks of employing him in his profession. This I can hardly explain, unless by the old saying, 'He is too good a poet to be a good physician.'" This was in the very early years of the nineteenth century, more than a century after the appearance of Samuel Garth's "Dispensary" (1699), a medicopolitical satire and picture of the famous quarrel between the College of Physicians and the Apothecaries, which Sir Edmund Gosse rather optimistically says gave the *coup de grâce* to the popular belief that the pursuits of poetry and of medical practice were incompatible. Rightly or wrongly, the medical fraternity generally seems to be of the same opinion still. Let us see how it has worked out in the past by considering instances of the combination of doctor and poet.

It has long been a widespread conviction, which the ever-increasing extension of knowledge and the resulting specialism would tend to strengthen, that a man cannot be first rate in more than one line of work, and there is much reason in the contention that a divided allegiance is not a popular recommendation. It is true that some men are so gifted that whatever profession they adopt they will make their mark at or near the top; Goethe and Albrecht von Haller in the past were examples of preeminence in poetry and medical science respectively, and efficiency in their second subject. The late Sir Benjamin Ward Richardson believed that "if John Keats had once tasted the true spirit of medicine, he would have become one of her greatest sons—an addition, perchance, to the some eight or ten of the men of all time whom medicine claims as her own, her poets of nature." As science and art are allied parts of a complete mind, Miss Amy Lowell thought that in due time Keats might have become keenly interested in science; but unfortunately from the point of view of this speculation he broke away from professional drudgery less than five years before his premature death on February 23, 1821, at the age of twenty-five. As Sir William Hale-White puts it, there were during his hospital days two Keatses in the same body, the diligent note-taker and student who attracted the notice of the great Sir Astley Cooper, and the poet who even then began to thrust the other aside, and indeed gave birth in St. Thomas' Street to that immortal line:

> "A thing of beauty is a joy for ever."

In the light of experience and in obedience to popular prejudice against serving two masters or mistresses, some medical men have concealed their poetic powers and productions, or have put them aside in a napkin during their active professional life. To publish anonymously and to await the verdict before declaring the responsibility is not peculiar to any profession, and ours is no exception. "The Pleasures of the Imagination" originally appeared without the author's name, but as an imposter called Rolt promptly claimed it Akenside put his name on the title page of the second edition, which was necessary in a few months' time. There has been some discussion, originated by Dr. Samuel Johnson's comment, whether the unauthorized and anonymous editions of Sir Thomas Browne's "Religio Medici," which contains a number of poetic fragments in the text, appeared entirely without his knowledge; but Geoffrey Keynes in his fine "Bibliography of Sir Thomas Browne" scouts any "such sharp practice" on his hero's part, though this is perhaps rather a hard saying for what after all seems a harmless experiment. From internal evidence Chereau ascribes thirty-two unsigned poems to medical men, among his collection of French physician-poets.

Sir Richard Blackmore, Kt.

Pseudonyms have naturally been employed, thus John Wolcot (1738–1819), the coarse satirist, was probably well advised to describe himself as Peter Pinder, "a distant relative of the poet of Thebes"; David Macbeth Moir (1798–1851) contributed no less than four hundred poems signed Delta to *Blackwood's Magazine*, while in busy practice at Musselburgh. The famous anthropologist and surgeon, Paul Broca (1824–1880), employed the anagram Bap. Lacour as his poetic name, whereas his senior colleague, P. A. Piorry (1794–1879), famous for the pleximeter and "Traité de la percussion médiate," made no secret about the authorship of his epic dedicated to Napoleon in 1815 and of the poem "Dieu, l'âme, la nature" in 1854. A friend of mine successfully conceals the authorship of "Horizons at Dawn and at Dusk" and of "Earth-Lays, Geological and Other Moods" under the sign of Colin Tolly. Mark Akenside, who changed his name from its original spelling Akinside, possibly for professional reasons, when he came up to practice in London, brought out the once popular "Pleasures of the Imagination" in his twenty-third year, and then becoming a haughty physician to St. Thomas' and Christ's Hospitals and Goulstonian and Croonian lecturer at the Royal College of Physicians, practically remained poetically dumb until within a year of his death, when he began to revise his great didactic poem and wrote some odes including one on "The Use of Poetry." Possibly he was influenced by the example of his senior at the College, Sir Richard Blackmore (1653–1729), physician in ordinary to William III and Queen Anne, who persisted in the practice of physic and the publication of epics with the result that he became the butt of the wits whom, it should be remembered, he had in the first instance attacked in a "Satyr against Wit" (1700) which, in addition to numerous easily recognizable personal sarcasms, contains the cheery remarks:

> How happy were the old unpolished times
> As free from wit as other modern crimes. . . .
> But this degenerate, loose, and foolish race
> Are all turned wits, and their great stock debase.

Blackmore has no claims to first rank as a poet, but he had an independent mind and probably not a conciliatory manner. At any rate he was not welcomed as a friend in either of the two camps of the followers of Apollo, the poets and the physicians; for in 1795, on the appearance of his epic "Prince Arthur," he was attacked by both, not, Sir Edmund Gosse says, because his poetry was bad but because both parties resented his trespassing on their preserves. For example his early struggles to obtain a livelihood as a schoolmaster and his later life were thus described in no generous terms:

By nature form'd, by want a pedant made,
Blackmore at first set up the whipping trade.
Next quack commenced; then fierce with pride he swore
That toothache, gripes and corns should be no more;
In vain his drugs as well as birch he tried
His boys grew blockheads and his patients died.

He was nicknamed "The City Bard," "The Cheapside Knight" and, by the ferocious Swift, "England's Archpoet"; but perhaps the most unkind cut of all was that his slightly junior colleague at the Royal College of Physicians and a brother versifier, Pope's "well natured" Sir Samuel Garth (1659–1718), chastized him on several occasions. Thus in "The Dispensary" he sternly reproves "The Bard":

Then dare not, for the future, once rehearse
The dissonance of such unequal verse
But in your lines let energy be found
And learn to rise in sense and sink in sound.

And elsewhere he twice administers snubs in the following terms:

To the merry Poetaster at Sadlers Hall Cheapside,
Then be advised, and scribble not again
Thou'st fashioned for a flail, and not a pen.
If B– –l's immortal wit thou would'st deny
Pretend 'tis he that writ thy poetry.
Thy feeble satire ne'er can do him wrong,
Thy poems and thy patients live not long.

And again:

Unwieldy pedant, let thy awkward muse
With censures praise, with flatteries abuse,
To lash and not be felt, in thee's an art,
Thou ne'er mad'st any but thy schoolboys smart.

Garth and John Arbuthnot (1667–1735), the only begetter of the character of John Bull, were both Court physicians and accepted equally by the wits and by the medical world of what has been called the Augustan Age in England. That they had personal charm is well known, and this is perhaps the reason why Blackmore, their apparently heavy colleague at the College and the Court, had such a different reception; in fact his name is perhaps best remembered, like that of Robert Montgomery, whose poetic effusion, "Satan, or Intellect without God," was so unmercifully reviewed by Macaulay, for the adverse and wickedly amusing criticisms handed out to him. Dr. Samuel Johnson seems to have been the only one to speak up for him and then in a rather moderate tone. It should, however, be admitted that his portrait by John Closterman, now on the staircase of the Royal College of Physicians of London, and an engraving by George White of another portrait by J. Vanderbank do not lend any support to the suggestion that his personality was forbidding or unpleasant. Garth and Arbuthnot had a light and human touch combined with the saving grace of humor; though possibly every consultant would not honestly applaud the lines, perhaps doubtfully ascribed to Garth:

See one physician like a sculler plies;
The patient lingers, then the patient dies;
But two physicians, like a pair of oars
Waft him more swiftly to the Stygian Shores.

His couplet in "The Dispensary":

To die is landing on some distant shore
Where tempests never beat or billows roar,

cannot fail to appeal to us all. At any rate Garth's and Arbuthnot's success proves that in spite of popular prejudice it was not impossible to be accepted as a physician and a poet at the same time, at least in those days. Even now with all our intensive specialization there are not wanting men of world-wide reputation who can write fine verse; Sir Charles Sherrington's "Assaying of Brabantius and Other Verse" (1925), Henry Head's "Destroyers" and Ronald Ross's poems are instances that at once spring to one's mind; but it must be admitted that their services to medical science outshine even their poetical works. Sir Donald MacAlister's "Echoes" (1913) are an amazing *tour de force*, for he translates Rómani into English, German into English and Scots verse, and vice versa, and modern Greek and Russian into English and old Scots with the greatest skill and apparent ease.

PRACTITIONERS OF BOTH MEDICINE AND VERSE

A question not without interest is which of the learned professions contributes most poetry; much might be said on behalf of each, the church, the law, and physic. The church has the advantage of attracting, at any rate in the past, a large number of classical scholars familiar with poetry and its technique; the bar on the whole may be said to draw the ablest men and to provide critics in large numbers; and medicine appeals to the practical man. It has been claimed for medicine by one of ourselves (Mitchell Banks) that it stands foremost among the professions in the number of men distinguished in literature who at least began life in our ranks. A long list might easily be compiled, but it will be sufficient to give a few examples of those who have taken up medicine for a shorter or longer time and have at one stage or another given their adhesion to the muse of song. Some have been poets who touched medicine, others practitioners who as a by-product or hobby threw off verse and some, such as Georges Clemenceau in "Le Grand Pan" (1895), have preferred to write poetry in the form of prose.

Some were transient students only and never qualified; S. T. Coleridge when less than fifteen years old was siezed with a passion for medicine and read many authorities, learning Blancard's Latin Medical Dictionary almost by heart. Southey also entered on the physic line but not for long. Francis Thompson (1859–1907), poet, author of "The Hound of Heaven," and mystic, spent eight years at Owens College, Manchester, but as a medical student he was a misfit. The incomparable John Philips (1676–1709), as he was posthumously called by an admirer who compared him with Milton, abandoned medicine when a student at Oxford, and may appeal to some as having sung the praises of tobacco in many of his poems. Sir Edmund Gosse confessed, to the Royal College of Physicians of London, that to be a surgeon was his early ambition and that he indeed had started on this course.

John Keats, whom J. M. Murry proclaims as "the greatest of Shakespeare's successors," qualified in July, 1816, at the Apothecaries Hall, but this marked the close of his life's medical chapter, and, as Sir George Newman says, "began his duty of superb alchemist." George Crabbe (1754–1832), according to Byron "Nature's sternest painter, yet the best," after a brief experience of poor practice took orders and only exercised his medical knowledge on the bodies attached to the souls under his care. Medicine may be said to have refused the overtures of Goldsmith, the source of whose medical qualification has been a vexed problem of historical research; and Tobias Smollett, the author of odes as well as his more famous novels, intermittently attempted, but never really succeeded in, practice. Schiller gave up his post as a surgeon in the army as soon as he could. In recent times Conan Doyle left the correction of astigmatism and errors of refraction for the detection of hypothetical crime, and, ever active and endowed with the great gift of imagination, incidentally wrote "Songs of Action" (1898).

Among those who continued to practice and publish their metrical products was Henry Vaughn (1622–1695) of Brecknockshire, who therefore styled himself "The Silurist" and was the author of a rather startlingly entitled work "Silex Scintillans or Sacred Poems and Private Ejaculations" (1650). His "Retreat" appears to have stimulated Wordsworth to the ode, "Intimations of Immortality," and his poems were pervaded with an atmosphere of mystic rapture; he evidently was no commonplace person. James Grainger (1721–1766) was successful in so far as his "Ode to Solitude" was applauded by Johnson, and he gained at least sensational attention for "The Sugar Cane," the remarkable anticlimax in which, "Say, shall I sing of rats?" evoked a vehement "No" from the Great Lexicographer and laughter from the privileged audience to whom it was read. He carried on his professional and poetic activities concurrently, but, though able, he did not make medical practice lucrative. He was no relation to the anatomical teachers of the same surname; or of course to James Granger, the print-collector and biographer, whose plan of extra illustrating copies of lives and so forth by inserting plates obtained from other works, which thus suffered mutilation, gave rise to the verb "to Grangerise" and incidentally sent up the price of books with desirable engravings to five-fold their original cost. In the intervals of his more important work Edward Jenner (1749–1823) wrote occasionally in verse, such as the "Address to a Robin." John Ferriar (1761–1815) of Manchester, advocate of the pleasing if illusory idea that anyone could become a genius if sufficiently industrious, was the author of a poem, "Bibliomania," recounting the joys of book collectors, and became prominent for his attack on Laurence Sterne, whom he accused of plagiarisms, a failing which others in turn ascribed to the critic. He was active as a physician to the Manchester Infirmary until his death. W. H. Drummond (1854–1907), who has been called "the Poet Laureate of British America," struck out a new line as the interpreter of the French Canadian life and thought in "The Voyageur," "The Habitant" and other poems. He was of Montreal, and so was John McCrae (1872–1918) whose untimely death in the War removed a well-known pathologist, a physician of great promise, and the critical author of a number of poems, the best known of which is the exquisite rondeau "In Flanders Fields." W. S. Thayer of Baltimore, another fastidious censor of his own creations, has often written but seldom broadcasted his verse; he must carry with him all who knew Sir William Osler in his lines:

A heart whose alchemy transforms the dross
Of dull suspicion to the gold of love.
A spirit like the fragrance of some flower
That lingers round the spot that this has graced.

Another group are those medical men whose poetic bent is not allowed to shine before men until they are on the way to retirement, when more leisure and the freedom from any anxiety that hobby may damage their professional prospects permit the products and remains of youthful facility in verse to blossom forth. Weir Mitchell was a case in point; when very young he submitted a collection of verse to a Bostonian publisher, and on its being referred to Oliver Wendell Holmes for his opinion, "The Autocrat of the Breakfast Table" advised the budding poet to confine his efforts in his desk until he was well established in medicine and about the age of forty. This Weir Mitchell took to heart, and, except for some unsigned verses in 1857, published nothing for popular consumption until over fifty years of age. In spite of Saint Beuve's dictum that in most men the poet dies young while the rest of the man lives on, it is therefore probable that poetic activity may lie latent, and be born again in more mature years, but whether the latest fruit is always the ripest is doubtful. Erasmus Darwin (1731–1802) of Litchfield, sacred to the memory of Samuel Johnson with whom he did not get on, was the author in his fiftieth year of "The Botanic Garden," a poem in two parts, the "Economy of Vegetation" and "The Loves of the Plants." There is a special interest about him and his speculations on evolution in connection with their possible influence on his grandson, Charles Darwin, who entered but soon abandoned the study of medicine. Thomas Gordon Hake (1809–1895), a Victorian poet, made a much cleaner cut between his professional and poetic life than did Erasmus Darwin, for he left physic with the definite intention of cultivating the muses at about the age of fifty, after which nearly all his poems were written. He was a member of Dante Gabriel Rossetti's circle, and a poet's poet, that is to say his verse was more acceptable to his peers than to the populace.

It is seldom that one, starting as a poet, then takes up medicine comparatively late; the following examples show an infinite variety of interests. Such a one was Thomas Lodge (1558–1625) who had an adventurous career. The son of a Lord Mayor of London, he went to the bar, traveled much, was a soldier and sailor too, not to say a freebooter, in the Spanish Main and the Brazils, and was the persistent parent of plays, pamphlets and poems, the most interesting of which is "Rosalynde: Euphies' Golden Legacy" (1590) which provided young Shakespeare, who was then but twenty-six, with the plot of "As You Like It." After 1596, a year of great literary activity marked by the appearance of four books, he went in for medicine and, taking the degree of Doctor of Medicine at Avignon in 1600 and D.M. of Oxford in 1602, practiced at first in Warwick Lane. Familiarity with the pen enabled him to dedicate to the Lord Mayor and Corporation "A Treatise on the Plague" (1603) then raging in London. Together with Matthew Gwinne and Raphael Thorius, both poets, the great William Harvey, and some others, he was, on May 11, 1604, examined at the Royal College of Physicians. They must have been a nest of rather twittering if singing birds, to vary Dr. Johnson's remark, and it is not unlikely that Harvey's knowledge may have raised the standard; Lodge failed on that occasion but was successful in 1609. Thorius was a devotee of tobacco, wrote "Hymnus Tabaci sive de Pacto" (1627) and with Gwinne argued in its favor, in spite of the Royal prejudice against it, at a medical disputation on the question "An frequens suffitus nicotianae exoticae sit sanis salubris" held at Oxford for the edification of James I in 1605. Lodge died in 1625 of the plague, thus being one of those who succumbed to the disease on which, as they had written, they were presumably authorities.

Martin Llewellyn (1616–1682) also played many parts, a scholar and poet-cavalier, until he was thirty-two, when he was ejected from Oxford for his Royalist activity, being thus, so the Harveian Librarian, Dr. Arnold Chaplin, tells me, the only Fellow[2] of the College of Physicians who actually bore arms in the war. Thomas Sydenham, Parliamentarian Captain of Horse, was never a Fellow. Then applying his genius to medicine Llewellyn became a Fellow of the Royal College of Physicians of London, but with the return of the Stuarts he was made physician to Charles II and Principal of St. Mary's Hall, Oxford. After four years he moved to Great Wycombe where he practiced and eventually became Mayor. He wrote poems published at intervals from 1646 to 1672, some in a humorous vein, others as loyal odes; one of the last, "Wickham Awakened; or the Quaker's Madrigal" in rhymed doggerel, written in 1672 when he was Mayor, was an attack on a Quaker rival who had annexed much of his practice.

T. L. Beddoes (1803–1849) published "The Bride's Tragedy" when nineteen years of age, wrote dramas, travelled much, became involved in political intrigues in Germany, and remaining abroad for the rest of his life decided in 1825 to abandon literature as a profession in favor of medicine. He attained merit as a physiologist, took his doctorate in Zurich in 1835, was nominated as a professor but not appointed for political reasons, and did some practice. During twenty years of his medical life he was writing and polishing "Death's Jest Book or the Fool's Tragedy," which was published in 1850 after his rather mysterious death in hospital. He left directions to his literary executor, T. F. Kelsall, with the note "I ought to have been among other things a good poet."

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[2] When a young physician Sir Charles Scarborough, after being ejected from his Fellowship at Caius College, Cambridge, for his Royalist sympathies, sought refuge at Oxford, and when anxious to take up arms, was dissuaded by William Harvey, who asked him to share his lodging, saying, "Prithee, leave off thy gunning, and stay here; I will bring thee into practice." This advice he accepted and in 1656 succeeded Harvey as Lumleian Lecturer at the College of Physicians of London (*vide* Gunther, R. Early Science in Oxford. 1925, III, 48).

A few born poets adopt medicine and failing therein allow their true bent to come out, as in the case of Oliver Goldsmith, as a wizard in words. It must be exceptional, if not unique, for a well-established poet to be summarily made M.D., even by the Archbishop of Canterbury, who still retains, but never uses, this power. Abraham Cowley (1618–1667), the well-known poet who in spite of his professed desire for quiet had an exciting life, is connected with circumstances which may easily give rise to blunders. A scholar of Trinity College, Cambridge, he wrote in 1639 an elegy on the death of his friend William Harvey, not to be confused with the discoverer of the circulation (1578–1657), whom as Warden of Merton and a co-Royalist he very probably met at Oxford after he had been driven out of Cambridge in 1643. It was at Oxford on December 2, 1657, that Abraham Cowley was made D.M. by edict of the Government in order, so his biographer, Sprat, considers, to serve as a blind for his activities in the Royalist cause. Cowley never published any strictly medical work, and there is not any evidence that he was interested in clinics, though his two books on plants (1662) are ascribed by Gosse to the preliminary study of materia medica. He should not be confused with Thomas Cawley, sometimes incorrectly spelt Cowley in medical literature, who in 1778, by the careful account of a single case of pancreatic calculi, earned the credit for the first description of pancreatic diabetes.

Is any one branch of the medical profession more favorably placed and prolific in verse than another? From their upbringing and associations it would naturally be anticipated that the followers of pure physic would be more productive than the wielders of the knife. This is probably true, but perhaps enough has been said about those concerned with internal medicine. Some distinguished surgeons have been poets, or at least have ventured into verse: Ambroise Paré (1510–1590) wrote sonnets and short verses in his various works, and a laudatory introduction of ninety Alexandrians to his pupil Jacques Guillemeau's (1544–1612) "Tables anatomiques avec les portraicts et déclarations d'iceulx. Ensemble un denombrement de cinq cents maladies diverses (1586)." Richard von Volkmann (1830–1889), whose name is better known in connection with his spoon, splint and ischemic contraction, and a special deformity, wrote under the name of Richard Leander; Paul Broca, as already mentioned, was a poet as well as a surgeon and an anthropologist. Sir William Blizard (1743–1835), who was surgeon to the London Hospital for fifty-three years and operated there in his eighty-fourth year, wrote an ode for the opening of its Medical School in 1785, which was set to music by Samuel Arnold, but drew from Sir Norman Moore the remark that "had he been longer contemporary with Pope it would certainly have secured him a place in the Dunciad." He was twice President of the College of Surgeons and in that capacity received the bodies of criminals from the common hangman with all the ceremony he loved and in full court dress. Another President of that College, the late Sir Rickman Godlee, wrote poems. I am allowed to quote from two of them a few lines which make us regret that they were never published:

Why should I fret myself with useless cares
If silent death steals on me unawares.
I will not seek to know the when or how,
But am content to dreadful fate to bow.

But who can read the book of fate,
And who would read it if he could.
Wiser is he who learns to rate
At its true worth the present state,
Nor strives to over-estimate
The evil or the good.

Mr. K. W. Monsarrat's poems (1922) are optimistic in days when such an attitude is a most welcome antidote to fears of wars, industrial and national.

Sir D'Arcy Power, ever ready to share his historical lore with others, has shown me some of his treasures of the sixteenth century poet-surgeons; John Halle, Thomas Gale, Thomas Vicary, and John Read while engaged in trying to raise the status of surgery in this country found time to diversify their surgical works and to produce occasional poems. Halle (1529–1568) brought out a 16mo volume (1565) "The Court of Virtue Containing Many Holy or Speretual Songs, Sonnettes, ets.," in the meter made so familiar by Tennyson's "In Memoriam"; he vigorously criticized the contemporary dress of the other sex in terms which some might think quite applicable today. Thomas Gale (1507–1587), a prose poet whom Isaac Walton imitated, wrote "Certaine Works of Chirurgerie" and "Certaine Works of Galen" both appearing in 1586, and was apprenticed to Richard Ferris of Paddington, barber surgeon to Queen Elizabeth in 1563. An occasional writer of verse, Ferris was Master of the Barber Surgeons Company and appears in Hans Holbein's famous picture of Henry VIII giving the charter to that newly incorporated Company, which is in the Company's Hall in Monkwell Street. George Baker (1540–1600), "one of his Magesties chiefe Chyrurgeons in Ordinarie," contributed, according to ancient custom, laudatory lines to introduce Maister Peter Lowe's "Discourse of the whole Art of Chyrurgerie" (1611), accompanied by this tribute from "John Norden Phisitian":

> Low is thy name, high grows thy fame
> Among all Englishmen,
> Thy booke shall save my verse from blame
> When world well weighs my penne.

The famous Thomas Vicary of the curiously entitled "The Englishman's Treasure or Treasor for Englishmen with the true Anatomye of Man's Body" (1585) also wrote occasional verses. John Read, another Elizabethan unearthed by Sir D'Arcy, wrote in meter "A Complaint of the Abuses of the Noble Art of Chirurgerie." The poetic habit of these Elizabethan surgeons was a fashion which faded away, but no doubt will be revived in due season.

Of the various specialties one of the most select is that of the anesthetist, and I have personal knowledge of some who, possibly inspired by their environment and provided with time for meditation while their surgeons are busy, have cultivated verse; thus the late Sir F. W. Hewitt had a light touch but a restraining modesty that never allowed him to bring out any collection of the topical poems published anonymously in hospital gazettes, and J. Blomfield has followed his master with acknowledged success. Laryngology, now such an energetic and successful specialty, has, as indeed is only right, contributed its quota of song. Oliver St. John Gogarty, author of an "Offering of Swans" (1923), has had much to do with water, as shown by medals for saving life, but there is no fear that his name will be "writ in water" only. Dan McKenzie's "Pride o' Raploch" is Scots vernacular verse and he is, I understand, venturing into English. Francis Sturm of Leigh, Lancashire, has written some notable poetry and translated Baudelaire.

Men in general practice form the bulk of the profession and, though not in the limelight, have done their share in keeping up the scholarly and poetical reputation of their profession. Some have been mentioned already, and of living men it is rather invidious to speak, for there are so many and it is so difficult to keep in touch with all current poetry, moreover many hide their talent as if it were a secret vice. I can therefore mention only the few whom I happen to know. Havelock Ellis recently (1925) published the sonnets he wrote forty years ago, before he became a medical student, together with translations of Spanish folk-songs. J. O. Tunstall's poems about the English Lakes breathe a true love of nature. F. B. Young, author of "The

Young Physician" (a novel), is a faithful follower of the present Laureate, has written poems, among them "Fever Trees" and "104 Fahrenheit" describing delirium, but like G. H. Vos, whose "Sargia" sings of Sark, appears to have retired from practice. David Rorie, D.S.O., of "Cults" and "The Auld Doctor and Other Poems and Songs in Scots" (1920) is the exponent of the Aberdeen vernacular. "The Old Doctor" has been finely drawn by James Wilkie Smith of Ryton-on-Tyne, and Maurice Jacobs sang of the old Infirmary of Newcastle upon Tyne. William Cullen of Glasgow, *clarum et venerabile nomen*, included a number of short poems in "Uncle Archie" (1925); Ronald MacFie has more than one volume to his name, and Habberton Lulham's "Songs of the Downs and Dunes" are known to many lovers of Sussex. Kenneth Rogers of Bromley has travelled far, from "The Tragedy of King James III of Scotland," "The Musings of a Medico" to "Thoughts of a Nature Lover." C. J. Whitby of Bath in "The Rising Tide" (1920) expresses the sterner side of life and realism. H. B. McCasky has a light touch of one familiar with human nature, and T. W. Parry, of Crouch End and not of Bath as the name might suggest, writes brightly of "The Surgery of the Stone Age," and "The Prescription." A distinguished friend of mine, who disguises his authorship under the simple letters M.R.C.S., has collected, under the title of "Odds and Ends," the occasional output of more than forty years, including poems published during the War, which make up two-fifths of the whole.

What then is the conclusion of the whole matter as shown by experience? The reading of poetry is a help, comfort, and means of culture in our hours of ease and even of disease; and as a hobby the writing of verse is a happy issue for our emotions, for there is no greater pleasure than creating something. Surely these are enough to establish the advantages of the cultivation of Poetry? More ambitious aims are hardly likely to tempt us, for it is fairly obvious that, as medicine and poetry are both jealous mistresses, a busy doctor can hardly hope ever to be a Tennyson or a Swinburne.

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GLEANINGS FROM OLD CHINESE MEDICINE

By BERNARD E. READ, M.D.

PEKING, CHINA

DURING the medical conference recently held in Hongkong, a group of scientific men had occasion to meet with one of the famous men of China, who has specialized in old Chinese medicine. One evening during our association meetings this gentleman invited us to dinner and entertained us most royally. After dinner he gave us a talk lasting about two hours upon some of the finer arts of Chinese medicine.

There were discussed two particular diseases with which Western science is unfamiliar, and concerning which I find no record in Chinese literature. Hence it would appear important to have these diseases recorded, together with the method of their diagnosis and treatment.

CHUANG HUNG PING

The Chinese terms "Chuang Hung Ping" (the mingling of the bloods) were given as referring to a disease said to result in the male after copulation just at the start of the menstrual period. It was explained that man naturally would not seek sexual intercourse during menstruation, but when the act was attempted unknowingly and the onset of menstruation took place at the same time, the male would subsequently become ill. The name means a knotting of the bloods, that is bloods of the male and female. The disease does not reveal itself until the end of three months when the patient has a bloody sputum and is attacked by general malaise. It is said that foreigners invariably confuse the symptoms with those of pulmonary tuberculosis. This seems a strange statement, seeing that Western scientific practice bases its diagnosis upon the bacterial findings. However, the exact diagnosis of this disease is said to depend upon the condition of weakness of the lungs and other organs as diagnosed by the mystic art of pulse-feeling.

Pulse-feeling. The art of pulse-feeling in China is a very ancient one dating from before B.C. 500. By placing three fingers side by side on the left and right wrists respectively of the patient, the Chinese physician claims to be able to obtain six indications of possible diseases in the internal organs. Extensive accounts of this art have been written by many writers. In general the left wrist indicates diseases of the kidneys, the heart and the sexual life. The right is felt for the lungs and so forth. At a small gathering of Western scientists on a later occasion our host demonstrated to me upon a number of people the method of pulse taking. He was a man of unusually quick powers of observation and I was very interested in his diagnosis of my own condition. In particular after taking my pulse, he picked out my lungs as being weak, which is quite in accord with my experience of pneumonia with empyema some few years ago. My balance of good health he said was maintained by especially good kidneys and wonderful bowels. The spleen was large, hence I had a good digestion. This last statement would be encouraging if true. Other persons present were similarly examined by a simple touch upon the wrists and diagnoses of a highly interesting character were put forward.

The extreme left pulse is tested for diseases of sexual "emotion." The extreme right wrist is felt for the lungs. These two pulses are the chief points for the confirmation of the above disease, though of course the final conclusions of the doctor are based upon a proper correlation of the nature of these two pulses with the others felt upon the two wrists. It would take a very long discussion to make intelligent the varying descriptions of the pulses, as for example, the drifting character of wood floating on water, a hollow pulse like an onion stalk, or slippery like a pebble rolling in a basin which indicates three months pregnancy, and so on.

Treatment. There are two types of prescription for the disease of Chuang Hung. Mild cases are treated by the simple administration of a decoction of one head of lotus seeds (*Nelumbium speciosum*), which is said to be sufficient for a complete cure. More advanced cases require treatment with the drug Ch'uan P'o Shih. This I have been so far unable to identify. Its appearance is like the sliced stalk of some common plant.

A B

A. Picture of Shen Nung, the Father of Chinese Agriculture and Its Use in the Healing Arts, Holding a Stalk of Millet, b.c. 2838. B. Picture of Fu Hsi, the Father of Mystic Rites in Chinese Medicine, Holding the Divining Diagram, b.c. 2838.

CHIA SE PING

A second disease, called "Chia Se Ping," the disease of the embrace, was described. It was of the nature of a particular kind of cold entering the system of the male during sexual intercourse, apparently on account of too little covering. The patient's symptoms occur as a pain in the small of the back, violent and persistent headache and a general feeling of weakness. The physician's diagnosis is assisted by the taking of the pulses, which reveal weakness in the kidneys, the lungs and other internal organs. The most interesting character of the disease is that if untreated the patient will most certainly die within two weeks. It should be noted that this is not in any way regarded as a common cold but is a specific disease associated with cold winds and sexual intercourse.

Hot and Cold Winds. Old Chinese medicine regards disease as an upset of the internal harmony of the "yang," male, and the "yin," female, principles, the greater the medium and the lesser types in any or all of the internal organs. This disturbance is caused chiefly by what is termed hot and cold winds. This nomenclature not only refers to Western ideas of colds and chills but applies to practically every form of disease. There are other less intelligible types of diagnoses, such as possession by a cat-devil. In this connection the Pent'sao gives what is regarded as a reliable prescription for exorcising cat-devils. "Use one bean each of castor oil seeds, croton oil seeds, and jequirity seeds with a small amount of cinnabar and wax. The patient after administering the medicine is surrounded with ashes and placed before a cinder fire. The medicine is spitten into the fire, and as it bubbles up a cross is marked on the surface of the fire, when the cat-devil dies."

Treatment. For the above "sexual cold" a prescription containing the following ingredients is recommended: Betel nut leaf (*charrica betel*), green peas (*phaseolus mungo*), tea leaves (Chinese *mo i brand*), olives (*canarium album*), lichi nuts (*Nephelium litchi*), licorice root (*Glycyrrhiza glabra*) and talcum powder.

It would be instructive to look into the individual properties of these drugs with regard to their ability to save a man from such a fatal disease. Betel nut leaves are commonly used throughout the countries of the Malay Peninsula as a kind of envelop in which is wrapped a slice of areca nut with chunam. It is universally partaken of and certainly does not appear to contain any potent principle. It is used in Yunnan province as a condiment. In medicine it is considered to have stimulant, corrective and prophylactic properties.

The green beans and the tea leaves are given for their cooling properties. The peas in particular are highly regarded for their value to counteract practically all poisons. They are considered to be resolvent and carminative. They are prescribed in obstinate dysentery, bladder difficulty in the aged, and in the sequelae to smallpox.

The Chinese olive is said to be stomachic, sialagogue, antiphlogistic, alexipharmic, anti-vinous and astringent. The pits incinerated and reduced to powder are thought to have the power of dissolving fish bones accidentally swallowed and are used in a similar way in the treatment of fluxes and eruptive diseases of children.

The lichi fruits are much esteemed by Chinese physicians. They are used as a sweet-meat at feasts and often given as presents to the newly married. They are not regarded as entirely without deleterious properties, for they are said to produce feverishness and nose-bleeding when eaten too freely. They are recommended in all forms of gland enlargement or tumors, being specially prescribed in orchitis and neuralgic disorders. Our host's brother, who is a physician trained in Western medicine in one of the best European schools, states that quiescent cases of gonorrhoea can be aroused by the administration of two or three of these fruits and they are of valuable assistance to him in diagnosis of sicknesses related to it. Western scientists have made extensive examinations of this well-known table fruit and no evidence has been obtained to warrant the above claims for this drug.

Licorice root is too well known in the West to need any elaborate description. It is greatly prized in the East on account of its great virtue as a tonic and for its alexipharmic alterative and expectorant properties. It is used to allay thirst, feverishness, pain, cough and so forth. It stands next to ginseng in importance, being credited with the property of rejuvenating those who consume it for a long time. It is applied with honey to burns, boils and other sores. It plays an important part in gun shot prescribing, hence it can be readily understood why such extraordinary virtue should be ascribed to it.

The Properties of Cinnamon

A long talk was given about Chinese cinnamon and its wonderful power in preserving and restoring the harmony of nature. It is a most exceptional drug in being able to restore both the "yang" (male) and "yin" (female) principles. Hence it enters into a large number of prescriptions and is found extensively upon the Chinese market. It was said that there is such a demand for it that it is impossible to secure genuine cinnamon in Hongkong or Singapore, South China and other tropical countries. A sample was exhibited, measuring about 35 cm. long, 12 cm. wide, and 6 to 8 mm. thick, for which was paid one thousand dollars Mex. Eleven other types of the same bark were exhibited and explained. For a scientific study of cinnamon the reader is referred to the work of K. K. Chen. The doctor told us that in all his maternity cases, after childbirth to prevent the onset of any kind of disease he always prescribes 2 drams of cinnamon powder in half a cup of water. Its unique power in maintaining the correct amount of the male and female principles in the system is necessary to the healthy mother. We learn more about this drug upon consulting the Chinese Dispensatory (Pent'sao). This book is the standard authority today for all Chinese medical practitioners. The following is an abstract of the monograph contained therein:

Cinnamon has stomachic, stimulant, carminative, astringent, sedative and tonic qualities. It is especially recommended in colic and excessive sweating. Postpartum difficulties and retained fetus are among the troubles for which it is prescribed, as also are snake bite and Rhus poisoning. The prolonged use of the better qualities of cinnamon is thought to improve the complexion, giving one a more youthful, rubicund appearance. Pao P'u-tzu said that if cinnamon was taken with toad's brains for seven years, one could walk on the surface of the water and never grow old or die. Chao, the hunchback, took the drug continuously for twenty years, with the result that hair grew on the bottom of his feet; he was able to walk five hundred li (200 miles) in a day and lift a weight of one thousand chin (1333 pounds).

The above diseases, described with their methods of treatment, are of peculiar interest at the present time on account of the work conducted in America and central Europe upon menotoxin, the toxic principle said to occur in the perspiration of women during the menstrual period. Dr. David Macht at the Johns Hopkins Medical School has conducted numerous experiments upon the subject, as published during the past two years in the *Journal of Pharmacology and Experimental Therapeutics.* It would be of interest if his findings were taken up by clinicians to see if there be any further evidence to be obtained, similar to the disease Chuang Hung described by this Chinese physician.

SOME HUMBLE WORKERS IN THE CAUSE OF ANATOMY A HUNDRED YEARS AGO*

By W. B. HOWELL, M.D.

MONTREAL, CANADA

"Facilis iactura sepulcri."

IN the year 1832 there came into force in England one of the most important laws ever passed in connection with medical education. It is generally known as the Anatomy Act and had to do with the regulation of the supply of subjects for dissection.

Such laws as were in existence before this were entirely inadequate. In the reign of Henry VIII the Company of Barbers and Surgeons (note the order of precedence in the names) had been incorporated. The act of incorporation provided that the members of the company and their successors "yearly for ever, after their said discretions, at their free liberty and pleasure, shall and may have and take without contradiction, four persons condemned, adjudged and put to death for a felony, by the due order of the King's laws of this realm, for anatomists . . . to make incision of the same bodies . . . for their further and better knowledge and instruction, insight, learning and experience in the said science or Faculty of Surgery, etc."

In 1565, in the reign of Queen Elizabeth, a similar privilege was extended to the College of Physicians and in 1663 to the Royal Society, each of which corporations was to have four bodies annually. In 1723 an unsuccessful attempt was made to induce the House of Commons to pass a bill providing that a larger number of bodies from the gallows should go to the anatomists. In 1752, however, the former acts were amended so as to include the bodies of all executed murderers. It is interesting to note that in the sixteenth century the Emperor Charles V ordered a consultation to be held by the leading divines of Salamanca to determine whether it was morally justifiable to dissect a dead body. How difficult it was in some parts of Europe to obtain bodies for dissection is shown by the fact that Cortesius, professor of anatomy at Bologna, was able to obtain only two bodies in twenty-four years. Later, however, Pope Benedict XIV issued a decree to the effect that the bodies of all patients dying in the Bologna hospitals should be dissected. At first there was great opposition, but when this died out, Bologna became a great center for the teaching of anatomy.

In Edinburgh, as far back as 1694 the anatomists were allowed to have "those bodies that dye in the correction house," and later "the bodies of fundlings who dye betwixt the tyme that they are weaned and their being put to schools and trades," also "the dead bodies of such as are stiflet in the birth, which are exposed and have none to own them" and the "dead bodies of such as are *felo da se* and have none to owne them."

One result of legislation which turned over the bodies of executed criminals to the anatomists was to make the idea of dissection very repugnant to the mass of the people. It was looked upon as the culminating indignity inflicted upon the victim of a disgraceful death. Nor did it add to the dignity of the medical profession that certain of its members followed the hangman and completed the punishment ordained by law.

Steadily growing interest in anatomy during the eighteenth century brought private schools into existence. At first the classes met at the residences of the teachers, but as the number of students became greater, houses were rented. Competition between schools became so keen that to supply the steadily increasing demand for subjects there came into existence a set of men, recruited chiefly from the criminal classes, who made it their business to steal bodies for the anatomists. They were usually called "resurrectionists" or "body-snatchers," and sometimes in a spirit of levity "resurgam homos," "sack-em-up gentlemen," or according to Samuel Warren, "grabs." When Sir Astley Cooper gave evidence before a committee of the House of Commons engaged in drafting the Anatomy Act he described them as "belonging to the lowest dregs of degradation." Joshua Brookes called them "the most iniquitous set of villains that ever lived." These gentlemen spoke with feeling, we may be sure, because they both had had dealings with them over many years and had suffered much at their hands. The members of the parliamentary committee had an opportunity to judge for themselves for some of the resurrectionists gave evidence before them.

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The body snatchers, who worked in gangs, obtained access to the cemeteries either by bribing the caretakers or by making them too drunk to interfere. They dug down quickly to the head of the coffin, through earth which, having been recently disturbed, was still loose and easy to remove. The lid of the coffin, having been forced up by means of a specially devised lever, was broken by the weight of the earth above it and the body was then pulled out. Each church had its own graveyard and as these were disgracefully overcrowded, especially in the poor parts of London, the graves were usually very shallow. The body snatcher of fiction, as we see him in Dickens' "Tale of Two Cities," Stevenson's "The Body Snatcher," and Samuel Warren's "Grave Doings," preferred to bring the whole coffin up and then put it back, thereby giving themselves a great deal of unnecessary trouble. The body was stripped of its grave clothes and put in a sack, great care being taken not to remove anything but the body itself, because there being no property in a dead body, its removal did not constitute theft. The earth was then replaced and the grave made to appear as much as possible as if it had not been disturbed. Sometimes relatives put shells and other small objects upon the grave so as to be able to detect desecration, by noticing their removal. The position of such objects was carefully noted before the grave was opened and they were replaced afterwards. Another source of material for the resurrectionist was the small undertaker's establishment to which many of the bodies of the poor were taken to await burial. Many burial services must have been held over coffins which contained nothing more than tan bark or brick-bats put there to make up for the weight of a corpse which had already found its way to the dissecting room.

Some of the leaders among the resurrectionists amassed quite respectable fortunes. One of the best known in London about 1820 was a man named Murphy who obtained ascendancy over his followers by lending them money and thus acquiring the power to throw them into a debtor's prison if they became refractory. He was very clever in playing off one school against another in order to keep up prices and forced the proprietor of one of them, a man who had incurred his displeasure, to pay twenty guineas for a subject. If a customer, exasperated by his insolence and high prices, opened dealings with another resurrectionist, Murphy, having found where his rival obtained bodies would have a grave opened there and a body left partially exposed, or perhaps on the ground. This would lead to an investigation, other graves would be found to have been disturbed, and with the secret help of Murphy, relatives would be enabled to trace the bodies of the departed and a general state of unpleasantness would ensue.

Joshua Brookes in Great Marlborough Street, London, had the misfortune at one time to arouse the anger of some body snatchers, and was punished by their placing, early one winter evening, two naked and decomposing bodies on the pavement near his establishment. Two young ladies, hurriedly walking along the ill-lighted street, stumbled over them, and by their agitated cries collected a crowd which would have vented its fury on the neighbouring anatomy school if the police had not arrived in time to protect it. Brookes, who lived over his school, was one night aroused from his sleep to interview a disreputable looking stranger who had brought him a body in a sack. When the purchase had been completed and his visitor had gone, being in a hurry to go back to bed, he kicked the sack with its contents down the stairs leading to the dissecting room and turned away. Before he had taken more than a few steps he heard sounds which arrested his attention, and returning, found the sack lying empty on the floor and a man standing by it. The intruder explained with a good deal of apprehension, for Brookes was a large and powerfully built man, that he had been drunk and that his friends had done him up in a sack and brought him there as a joke. The interval between his hurried explanation and the moment when he shot out into the street seems to have been short and breathless. No doubt as he limped home he made a firm resolution that on future occasions, when an anatomy school was to be robbed, he would choose one which was kept by somebody not quite so large and savage as Mr. Brookes, or else arrange for one of his confederates to impersonate the corpse.

Brookes, who was a very eccentric character, was remarkable chiefly for the excellence of his teaching, the quantity of snuff he consumed and the filthiness of his person. An acquaintance wrote of him: "In his ordinary appearance I really know of no dirty thing with which he could compare; all and every part of him was dirt, and his house was no cleaner than his person; yet he sometimes came out as a pleasant gentlemanly person in black with a powdered head, cleanish hands, yet snuffy withal, and not lacking in good manners and information." The College of Surgeons in 1824, having declined to recognize his course of lectures any longer, brought about the ruin of his school, and he died penniless in London in 1833.

There was a good deal of shipping of bodies from one part of the United Kingdom to another according to the fluctuations of supply and demand. For several years in Dublin, previous to 1826, the Anatomy School of the Royal College of Surgeons of Ireland was used, with the connivance of the college servants, as a sort of warehouse for the storing of bodies for export. Bodies for shipment were packed in crates, packing cases or barrels according to the customary method of shipping goods manufactured at the town from which the bodies were shipped. The *Liverpool Mercury* of October 13, 1826, informed its readers that thirty-three human bodies had been found in casks on a wharf where they were awaiting shipment from Liverpool to Edinburgh.

Not only were the bodies stolen for the purpose of obtaining subjects for the study of anatomy, but also to enrich museum collections. For instance, the doctors of one of the Edinburgh hospitals wished to get the head of a child who had died under their care from hydrocephalus, but the relatives refused their consent. The body was buried in the cemetery of a small village near the Firth of Forth and the grave carefully guarded by professional watchers, at first both by day and night, but later at night only. At length one afternoon two well-dressed gentlemen drove up to the village inn in a dogcart. They left the horse to be looked after and told the landlord that if in their absence a servant in livery came with a package he was to be told to put it in the dogcart. The servant came in due course, deposited the parcel and left. Shortly afterwards the two gentlemen reappeared and drove off but not before a sharp stable boy had drawn the landlord's attention to the strong resemblance between one of the gentlemen and the servant in livery, and had been snubbed for his officiousness. That evening when the watchers arrived at the burial ground they found the grave had been robbed. The culprits, who were never found, are believed to have been a young man named Liston who afterwards became famous as a surgeon, and Crouch, a notorious London resurrectionist. Crouch, who had been well known as a prize-fighter in his early days, later in life gave up stealing bodies and took to dealing in human teeth. He obtained a license to follow the army in the Peninsular as a sutler and used to go about at night after an action pulling the teeth of the killed and helping himself to any valuables which he could find on their persons. No doubt he was not too particular to make sure that life was extinct before he took the teeth. In the course of time he earned enough money to set up as a hotel keeper in Margate, where at first he was prosperous enough, but when it became known who he was and how he had earned his living previously, his business went to ruin and finally he died miserably poor in London. There was at that time no manufacturing of artificial teeth and how handsomely dentists paid for sets of teeth obtained from human skulls may be realized from the fact that on one occasion Murphy, having obtained access to a vault where there was a number of dead bodies, secured in a single night enough teeth to bring him in £60.

There is at the present day in the Museum of the Royal College of Surgeons of England an interesting manuscript written by a resurrectionist. The following are some extracts from a copy of it:

1811. Nov. 30th. At night went out and got 3. Bunhill Row, sold to Mr. Cline, St. Thomas's Hospital.

Tuesday, 3 Dec. Went to look-out[1] and brought the shovils from Bartholomew, met early in the evening at Mr. Vickers[2] did not go out that night, Butler and me came home intoxsicated.

Friday 6th. Removed one from Bartholomew to Carpue.[3] At night went out and got 8. Dan'l at home all night. 6 Back St. Lukes and 2 Big Gates; Went 5 Bartholomew. 1 Frampton 3 St. Thomas's, 3 Wilson.

Tuesday 10th. Intoxsicated all day; at night went out and got 5 Bunhill Row. Jack almost buried. [How little unmanly repining there would have been if "Jack" had been completely buried! With what zest his body would have been offered to the anatomists!]

Friday 27th. Went to look-out, came home, met Ben and Dan'l. at 5 o'clock, went to Harps, got 8 large and took it to Jack's house, Jack, Bill and Tom not with us, getting drunk.

Saturday 22nd. Went to look-out me and Hollis, Bill staid in the Boro, got paid £4.4 for the above a very queer one received but two guineas for the one at Barth[1]. Would not do for lecture. Settl'd each man's share, £ 1.16.6. At night the party went to Weigate, the thing[4] bad.

1812. Dec. 5. Sat. Remained at Barth[1] packing up for Edinboro, sent 12 to the wharf for the above place, at home all night.

It is believed that the diary was written by a man named Naples who had been in the Royal Navy and was in H.M.S. Excellent at the battle off Cape Vincent.

Sooner or later the caretakers of graveyards who had accepted bribes were found out and discharged. They naturally gravitated to their confederates and became resurrectionists.

It was not only by robbing graves that bodies were obtained. On one occasion a well-known resurrectionist having the good fortune to be near a man who fell dead in the street explained to the bystanders, with every sign of sorrow, that it was a dear relation and as quickly as he could obtained a cart and whisked the body off to the nearest anatomy school. Such a piece of good luck must have seemed like the direct intervention of Providence in his behalf.

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[1] Watched for funerals.

[2] Probably the landlord of a public house.

[3] J. C. Carpue who had an anatomy school in Soho. He was mentioned in Tom Hood's poem about the resurrectionists. On one occasion at the request of some artist friends he obtained a body warm from the gallows, nailed it on a cross which he then erected. When rigor mortis had developed the artists took a cast of the body.

[4] The body.

A man named Clarke managed by his sympathetic bearing to insinuate himself into a house where a four year old child had died and after carefully noting the position of the coffin near a front window, went out and brought back a glass of something which had the effect of putting the woman who was watching the body into a sound sleep. He then angled through the window for the body with a stick and succeeded in getting it, but unfortunately for him, a policeman who knew his reputation arrested him before he had gone very far and he was sent to gaol for six months.

A favorite trick was to sell a body to one of the schools and then inform the police of its presence there. Confederates, impersonating the relatives of the deceased, would accompany the police during a raid and after getting possession of the body would sell it to another anatomist.

Many thoughtful people during the early part of the nineteenth century realized the necessity of providing material for the study of anatomy and bequeathed their bodies to the anatomists. In a single fortnight, a document was signed by ninety-eight people, including physicians, medical students, lawyers and clergymen, who agreed to make this provision in their wills. Jeremy Bentham, the celebrated jurist, who directed that his body should be disposed of in this way, was dissected and his skeleton put in the Museum of University College where it has remained to this day. It was the irony of fate that he should have died after the passing of the Anatomy Act. No less a personage than the Duke of Sussex, uncle of Queen Victoria, wished his body to be used after his death for the benefit of medical science. His wishes, however, were not carried out for he was buried with great pomp at Kensal Green Cemetery long after the Anatomy Act came into force.

The following description is copied from Lonsdale's "Life of Robert Knox":

The Resurrectionists were always on the "qui vive" for dying persons without friends, and to know all about their history, and if possible to personify the individual of whom the deceased had spoken in his or her last moments. Marvellous were the expedients resorted to by these false claimants of the unprotected dead, and equally marvellous was their success, considering that all the various personifications of character rested with so small a group as three or four men, one of whom had to profess direct kinsmanship with the deceased. A rascal of the name of Andrew Lees was the leading spirit in the funereal line. He was a tall gaunt fellow, with a long pale face, the muscles of which were exceedingly pliable to any emotional need—tragedy, comedy, or farce. Grotesque in look and gesture, and wearing a cast-off suit of black, that had not been made for his "shrunk shanks" the students named him "Merry Andrew" and over his cups he could maintain the fool's part well. When assuming the character of mourner his appearance was dismal enough, his pale face, with dropped jaw, set off by the habilements of grief and odd manner, far surpassing any theatrical "get-up." His approach to the house of death was that of a stranger from the country timidly enquiring for a certain house, on entering which, his bleared eyes, that would have made the fortune of a London "mute," became suffused with tears. After dwelling on the virtues of his "dear relation" he would at length intimate that he wished to convey the "remains" to the family burial place in the country; that he and some friends would return with a cart and coffin towards evening. His "friends" all in the same line were first "Spune" as he was called, a little man who shaved very cleanly and looked as demure and resigned as a Methodist preacher, so saintly, and barring his greasy clothes, of truly "sweet savour"; secondly, Mowatt, who got the name of Moudiewarp (moldewarp) from his successful imitation of the mole in burrowing the earth; thirdly, the mock minister, a clergyman who was personified by a deep-dyed vagabond who called himself Howard, in the hope of hiding his iniquity under a noble English name. Dressed in a black suit, too seedy for even a curate by the fell-sides of Cumberland, and with a white choker, the "praying Howard" officiated a la mode, improving the occasion by calling upon those around the bier to reflect on the uncertainty of life and the need of spiritual regeneration, for man was but a vain shadow. The group of mourners having played their parts, the funeral cortege moved towards the suburbs. As soon as night and circumstances favored the change of scene, the black curtain was raised; the dramatis personae mounted the cart and returned to Edinburgh, and lost no time in transferring the body to the anatomical rooms. With cash in hand, the quaternion had a night of it, and Merrylees, now seen in his character of the laughing Mercutio, made the welkin ring till he had put each of his "friends" below the table dead drunk.

In Canada the day of the body snatcher persisted much later than in England because the Anatomy Act in the Province of Quebec entailed no penalties and therefore its provisions were not carried out. The writer has had the privilege of reading an article on this subject written by Dr. F. J. Shepherd, formerly professor of anatomy at McGill University, and published among some other papers for private circulation. When Dr. Shepherd first began to teach anatomy at McGill in the early seventies he had to make use of subjects obtained by surreptitious means. The bodies were stolen from graveyards by medical students, chiefly French-Canadians, who paid their way through college partly, or wholly, by the money they earned in this way. Many bodies were taken from the Roman Catholic cemetery on Mount Royal and brought down the Côte des Neiges Hill on toboggans. Dr. Shepherd in his early days was more than once fined for having, in the dissecting room, bodies which had been obtained in this way. On one occasion a French student found the body of his uncle in the dissecting room and said to Dr. Shephered: "What for you got mine oncle here?" After some conversation he resigned his claim with the remark, "S'pose mine oncle come, s'pose he stay." Another student found his grandmother on a dissecting room table. Many dead houses in which the bodies were kept for burial in the spring were robbed. The gradually increasing indignation was brought to a focus when a number of nuns and their pupils died during a typhoid epidemic in winter and their bodies were stolen. Some of bodies were those of young girls from the United States whose relatives, when they came to claim them and found they had disappeared, raised a hue and cry. The robbers, alarmed by the storm they had caused and afraid to take the bodies to the dissecting rooms, kept them hidden in the snow until rewards were offered for their return, when they had the satisfaction of receiving compensation for their time and trouble. After this the law was amended and body snatching in the Province of Quebec was stopped.

The gradual development in England and Scotland of a strong feeling of indignation at the frequency with which graves were desecrated led to the exercise of much greater care in the hiring of honest and vigilant guards. Volunteer patrols visited the burial places at night and if the resurrectionists were caught they were roughly handled. There are still in some Edinburgh burying-grounds especially constructed graves called "mortsafes" covered over with iron work to prevent their being robbed. Watch towers provided with bells to herald the advent of the "minions of the moon" can be seen to this day in some of the graveyards in the north of Scotland. One of the best preserved examples is in the small village of Kincardine O'Neil in Aberdeenshire. The result of these and of other measures was not to put an end to the scandal, but merely to raise the price. Sir Astley Cooper said before the parliamentary committee to which allusion has been made, that he could obtain the body of any one who had died in England be he ever so prominent; the only difficulty would be the price.

Since so much money could be obtained for dead bodies and the difficulties and dangers of stealing them were so great, it occurred to certain progressive minds that the simplest and least troublesome way to obtain a body was by murder. It was the detection of these murders, and the intense public excitement resulting from the trial of the culprits which awakened parliament to the necessity of passing the Anatomy Act.

The idea of killing people in order to sell their bodies was not new in the nineteenth century. In 1752 in Scotland, two nurses, Helen Torrance and Jean Waldie, were hanged for murdering a boy and selling his body to some medical students for two shillings and ten pence, plus the "price of a dram." What first directed the attention of the public to the necessity for legislation was the famous case of Burke and Hare in Edinburgh.

Burke lived with his mistress, Helen M'Dougal, at a tramps' boarding house kept by a couple named Hare, between whom no marriage ceremony had been performed, though by the law of Scotland they were man and wife. What first directed the attention of these two unconventional gentlemen to a new and interesting means of adding to their respective incomes was the death in the boarding house of a lodger named Donald who owed Hare £4. This occurred on November 29, 1827. A conference was held and as a result the body was sold to an assistant of Dr. Knox, the anatomist, for £7.10. No questions were asked; indeed every encouragement was held out for future dealings of the same sort. We may easily believe that this profitable transaction started Burke and Hare and the two women thinking, and that the glances which they directed at any ailing inmate of the boarding house were expressive of a very sinister interest. By and by a lodger named Miller fell ill and when he was too weak to resist, Burke and Hare held a pillow over his face until he was suffocated. His body was sold to Dr. Knox for £10. The partners now took to prowling about the slums on the lookout for feeble and friendless people whose disappearance would lead to no fuss. In all there were sixteen murders committed before the arrest of the culprits.

On April 9, 1828, they committed the first of the murders for which Burke and M'Dougal were tried. The body of the victim, a disreputable girl of eighteen years of age, who had been remarkable for beauty, was sold to Knox for £10 within four hours after her death. Its beauty, which excited a great deal of comment among the students, induced Knox to bring in some artists who made drawings of it. Some of his assistants who recognized the body and asked Burke how he came by it were told that she had killed herself with drink and that they had bought the body from her relatives. Apparently nothing more was said about the matter at the time. In June, Burke and Hare committed a particularly atrocious murder; they smothered an old Irishwoman who had come to Edinburgh to find some friends, and Burke killed her grandson, a deaf and dumb boy of twelve, by breaking his back. The two bodies were packed into a herring barrel and put on a cart belonging to Hare. The horse, having stopped on the way to Knox's and there being no possibility of inducing it to proceed by any amount of beating, the barrel was taken off the cart and put on a porter's barrow to complete the journey. The refractory horse was a recent purchase of Hare's and was found to have two large holes in its shoulder which were stuffed with cotton and covered over with a piece of skin from another horse. Later in the year Burke and M'Dougal went to Falkirk for a holiday. Before they left Mrs. Hare tried to persuade Burke to kill M'Dougal and sell her body to the anatomists. Mrs. Hare's reason for wishing to kill her was because she was a Scotchwoman and could not be trusted.

The last two murders were committed in October, 1828. There was, at this time, in Edinburgh, a half-witted youth named James Wilson who was generally spoken of as "Daft Jamie." Ragged, bare-footed, hatless, he was a familiar figure and something of a favorite. The two partners enveigled him into Hare's house and made him partly drunk, threw themselves upon him when he had fallen asleep, and after a desperate struggle, for he was very strong, they succeeded in strangling him. When the body, for which £10 were paid, was recognized by the students, Knox affected not to believe that it was the body of "Daft Jamie," but as soon as a hue and cry broke out over the boy's disappearance he ordered the dissection to be begun in order to prevent identification. Although there had been a violent struggle and although the body was brought to Knox's very soon after death, it was accepted without enquiry. The last murder and that which led to the arrest of the culprits was that of Mrs. Docherty, a little old woman who had come from Ireland to search for her son. She was enveigled into Burke's room and after participating in some Hallowe'en festivities was suffocated. Next day, two of Hare's lodgers, a man named Gray and his wife, became curious to find out what had become of the little old woman, and when by an oversight of Burke they were left alone in his room for a few minutes one of them lifted up the corner of the straw mattress and saw a naked corpse underneath. They told the police, who arrested the Hares, Burke and M'Dougal, and next day found the body of the murdered woman at Dr. Knox's. A post mortem was performed by Dr. Christison, then professor of medical jurisprudence at the University, who found that death had been due to asphyxia though there were no marks about the face or neck to show how this had been caused. As in the case of most of the other victims, her struggles had been restrained by the two men while one held his hand over her mouth and nose until she was dead. It was this method of quietly killing without leaving any trace of the means that was responsible for the introduction into the English language of a new word, the verb "to burke." It is defined in Webster's dictionary as (1) "To murder by suffocation or so as to produce few marks of violence, for the purpose of obtaining a body for dissection. (2) To dispose of quietly or indirectly; to suppress; to smother; to shelve, as to burke a parliamentary question."

The prisoners, repeatedly examined, denied having anything to do with the murder. After a month's consideration of the case the Lord Advocate did not feel justified in bringing it to trial with the evidence in his possession and so Hare was given the opportunity to turn King's evidence, and he readily accepted it. Through his revelations the indictment was drawn up so as to include the murders of "Daft Jamie" and Mary Patterson. As he could not bear evidence against his wife she was discharged and only Burke and M'Dougal were tried.

The public interest in the case and the indignation against the culprits can be realized from the fact that when the trial took place on Christmas Eve, 1828, the Edinburgh police were reinforced with 300 men. The infantry at Edinburgh Castle and the cavalry at Piershill were kept under arms in case their services should be needed. The trial was held before four of the most distinguished judges in Scotland. Among the eminent counsels appearing on behalf of the crown was Archibald Alison, who afterwards became famous as the historian of Europe. Burke and M'Dougal were each represented by four of the leading advocates in Edinburgh, attracted to the case more on account of the public interest in it than for any payment in money. The most interesting and conclusive evidence, of course, was given by Hare and his wife. The latter, who must have been offered immunity from punishment in return for evidence, said that when Burke attacked Mrs. Docherty she and M'Dougal "flew out of the room," and that when a quarter of an hour afterwards they returned, the woman had disappeared. "We asked no questions," she said, "I had a supposition she had been murdered; I have seen such tricks before."

On Christmas morning, 1828, the jury found Burke guilty and the indictment against M'Dougal "not proven." He was then condemned to be hanged on January 28, 1829, and his body to be "publicly dissected and anatomized."

In the days before his execution he exhibited an edifying piety. There were moments, however, when his thoughts were concentrated on purely worldly matters. "I think," he said, "I am entitled to get that £5 from Dr. Knox which is still unpaid on the body of the woman Docherty." When asked what he wanted the money for, he said it was to buy a coat and waistcoat to wear at his execution. Before he died he made a full confession in which he took credit to himself that he and Hare had never been guilty of body snatching. On the scaffold he knelt to say a prayer and was careful to kneel on a silk handkerchief to avoid soiling his trousers. He was hanged in the presence of some 20,000 to 25,000 spectators, among whom it is believed was Sir Walter Scott, who was greatly interested in the case. The body was handed over to Dr. Munro, the anatomist, for public dissection and the skeleton is today to be seen in the Anatomical Museum of the University of Edinburgh. So great was the curiosity to see the body that there was fierce rioting between the police and the students who had been unable to gain admittance. Thirty thousand people are said to have filed past the body.

What ultimately became of Hare, who seems to have been, if anything, the guiltier of the two, is not known. There used to be a story that he obtained employment in a lime pit, and on his fellow workers discovering his identity, that he was thrown into a pit and blinded, and afterwards begged on the streets in London.

The revelations which were made at the trial induced a reign of terror among the poor, not only in Edinburgh, but in all the large cities of Great Britain. To be murdered for purpose of robbery had been looked upon as the privilege of those who were more or less well off, but for the purposes of men like Burke and Hare, the poorer and more friendless the person, the more likely was the crime to go unnoticed, and therefore the greater the likelihood of its being attempted. What had been protection against murder was now found to provide a motive, as no one would be so poor that his body was not worth £10.

The most interesting figure in this strange case, apart from the actual offenders, was Dr. Knox, who did not, however, appear at the trial. When his connection with them became known there was an outburst of intense indignation. He was fiercely denounced in the press and shortly after the trial a mob hanged, and then burnt, an effigy of him in front of his house, and broke his windows with stones. He at first made no attempt to defend himself against his accusers in the press. Later a committee was formed with the Marquis of Queensberry as chairman, to enquire into his connection with the murderers, but as the personnel was chosen by Knox himself and the meetings were held privately without publication of the evidence, the result cannot be said to have established his innocence in a very convincing way. Moreover, the chairman suddenly, without explanation, severed his connection with the enquiry before it was finished.

Knox in his early days had been an army surgeon. He had served with the army in Belgium during the Waterloo campaign and later in South Africa. In 1825, at the age of thirty-two, he began to lecture on anatomy and physiology in Edinburgh. His genius for teaching and his faculty of inspiring a love of science for its own sake brought him so quickly into the front rank of teachers that in the winter of 1828–1829 he had a class of more than 500, including, besides medical students, barristers, divinity students, military and naval surgeons, and naturalists. To listen to Knox in his lecture room was the greatest intellectual treat the Scottish capital could provide. Taking the keenest interest in the members of his class, he became the guide, philosopher and friend of many of them, and was repaid with their trust and devotion. Macaulay said of John Wilkes "that he was so hideous that the caricaturists were forced, in their own despite, to flatter him." This might with equal truth have been said of Knox. He had, like Wilkes, a markedly prognathous jaw, but was, in addition, severely pitted with smallpox, had only one eye, and was almost quite bald. His face, neck and shoulders were in continual movement from habit spasm. It may have been to make up for the deficiencies of his face that he was extremely careful of his dress, which according to his biographer was "significantly gay, if not loud in colouring." Like Wilkes, Knox was, in spite of his looks, a great favorite with women. However popular he may have been with his students he was anything but liked by his colleagues. His gift of sarcasm filled Edinburgh with his enemies, and his contemptuous references to matters of religious belief gained him the disapproval of the orthodox. That he had plenty of physical courage is shown by the fact that on the night when his effigy was burnt he walked unrecognized through the mob to the house of a friend. When expostulated with he threw back his coat and showed himself to be armed with a sword, pistols, and a Highland dirk. "You see my arms," he said, "and had I been called upon to defend myself, I would have measured a score of brutes."

The Burke and Hare incident does not seem to have affected Knox's professional career at the time. It was not until 1835 that the number of his pupils began to fall off. This was due partly to the difficulty in getting subjects, partly to a decline in the fortunes of the Edinburgh medical school, and partly, no doubt, to the activities of his enemies. He applied for the professorship of pathology in 1837, and later for that of physiology, but was unsuccessful on both occasions. He moved to Glasgow in 1844 and later to London, where he died at the age of seventy-one, the last part of his professional career having been spent as a general practitioner in Hackney.

How much Knox was really to blame for buying the bodies of the victims of the murders will probably never be known. Burke's confession ends with the following exoneration of him: "Burke declares that doctor Knox never incoureged him, nither taught him or incoregd him to murder any person, nether any of his assistants, that worthy gentleman, Mr. Fergeson was the only man that ever mentioned anything about the bodies. He inquired where we got that young woman Paterson." It is hardly possible to imagine that Knox had no suspicions, but it is, on the other hand, easy to imagine that in his enthusiasm for science and for teaching, in his desire to attract students by maintaining a reputation for always having plenty of subjects for dissection, he may have carefully refrained from making enquiries. To have got one set of resurrectionists into trouble might easily have frightened the others away and led to his own ruin.

A case similar to that of Burke and Hare occurred in London in the year 1831. Three men, Bishop, Williams and May, having brought the body of an Italian boy to the dissecting room at King's College, and suspicions being aroused, the demonstrator, Mr. Partridge, gave the three men into the custody of the police. They were tried, found guilty and condemned to death, the sentence of May, however, being commuted to transportation for life. Bishop and Williams made a confession which revealed the murder and selling of the bodies of a woman and another boy. Their method of killing their victims was to stupify them with rum and laudanum and then lower them head first into a well by means of a rope tied to the ankles.

In 1832, yielding to the overwhelming pressure of public opinion, Parliament at last passed the Anatomy Act. It provided for the appointment of inspectors of anatomy. Persons having lawful possession of a body had the right to give it up for dissection. This affected more especially the unclaimed bodies of the poor who had died in public institutions. No dead body could be removed for forty-eight hours after death, nor without twenty-four hours' notice being given to the inspector of anatomy. A proper death certificate was to accompany the body. Perhaps most important of all was the doing away with the dissection of executed criminals. With the passing of the Act desecration of burial-grounds and the trade of the body snatcher and burker became things of the past.

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PIRATE AND BUCCANEER DOCTORS

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IF romance lie in encounters with the unknown, whether that unknown be in the depths of a man's own heart, as in the romance of love, or in foreign circumstance, as in the romance of battle and adventure, then the present quickening of interest in sailing ships and older matters of the sea is understandable and praiseworthy.

For yearnings toward romance will never die in the spirits of boys and men who, if they cannot find romance in the present, will seek it in the past.

And sailing ships are among the last of the natural encounterers of the unknown; their masts and yards, lacing the skyline of the former San Francisco waterfront, lie unforgotten within the memories of even the younger of us.

There is little of the unknown left to encounter: Rockwell Kent had to go to the ends of the earth, to Tierra del Fuego, to find it. Science, perfection of mechanics and mathematical calculation are driving adventure to the wall. There are no longer uncharted seas. The very air currents will soon be charted, and adventure be a matter of capacity of gas-tanks and strength of fuselage. When Andrews was asked what adventures had befallen him in the Gobi desert, he replied that he had had no adventures, that adventures were a confession of poor calculation or unpreparedness.

Yes, Romance of Adventure will disappear, if it has not already done so; it will find a puny substitute in Romance of the Soul, in men's boring about in the objects and subjects of their own emotions and desires; an onanistic tickling of their own and their neighbor's navels; or in more or less melancholy reflections over deeds and adventures of the past.

So we who have looked down from Telegraph Hill and have seen a gently swaying forest of masts girdle old wooden docks, and have stood on the cliffs at Baker's Beach and watched square-rigged ships, all sails set, bear down past hovering pilot boats into the Golden Gate, think longingly of these last adventurers and of the brave lives that disappeared with them.

A certain romantic inclination of my own and a confidence in the same bent in others, then, are my reasons for discovering to the readers of the Annals of Medical History the names, at least, of some of their hardier old colleagues.

Every one knows what a Pirate is. The line dividing him from a Buccaneer is a hazy one, yet there is a faint and hazy line. A pirate scrupled not whom he would make his prize; the buccaneers were originally French and English cattle hunters settled on the Island of Tortuga near Haiti, whose hereditary enemy and prey were the Spanish. Later they enlisted with them Dutch and occasionally Portuguese. Their warfare was at first legitimate; during the war between England and Spain they sailed under English or Jamaican letters of marque. The intricacies of the various outbreaks of war, treaties of peace and armistices, their application north and east of the line and their ineffectiveness south and west of it are too complex to be related here. Let it suffice that from about 1630, when we first begin to hear of buccaneers, until 1697, when the last legally countenanced privateering expedition under Sieur de Pointis set sail from France and took Cartagena with a force composed of Frenchmen and of Haitian buccaneers, most buccaneers made some effort to equip themselves with papers that would lend to their raids a show of legitimate warfare. It is true that many of the papers ill stood scrutiny. Some were little better than fishing licenses. Here is what Esquemeling relates of the commission under which the first great buccaneering fleet ravaged the Pacific and laid siege to Panama.

> We shewed him our commission, which was now for three years to come. This we had purchased at a cheap rate, having given for it only the sum of ten ducats, or pieces-of-eight. But the truth of the thing was that at first our commission was made only for the space of three months, the same date as the Frenchman's was; whereas among ourselves we had contrived to make it last for three years—for with this we were resolved to seek our fortunes.[1]

In 1670 a treaty of peace was concluded between England and Spain, and more or less hearty attempts were made by Jamaican governors to enforce it in the West Indies and on the Spanish Main. After this English vessels pretending to legitimacy were forced to seek papers from the French colony in Hispaniola or from some of the smaller English West Indies where piratical governors still issued privateering letters in defiance of orders from the main colony.

The way of the buccaneers grew harder and harder; those of them who chose to continue their depredations upon their hereditary Spanish enemy sailed without papers. Some sought refuge in the North American colonies; the governor of North Carolina in particular seemed disposed to shut a friendly eye to piracy and to profit by booty brought into Carolinian ports and rivers. Other raiders made their way across the Isthmus of Panama to the South Seas where they harassed the west coasts of South and Central America without fear of surveillance.

The heyday of buccaneering lay in the last half of the seventeenth century. The eyes of the buccaneer were first opened to the riches of the sea by Pierre le Grand who, some time between 1630 and 1640, boarded a Spanish galleon from a small boat:

> The boat, . . . wherein Pierre le Grand was with his companions, had now been at sea a long time, without finding anything according to his intent of piracy suitable to make a prey. And now, their provisions beginning to fail, they could keep themselves no longer upon the ocean or they must of necessity starve. Being almost reduced to despair, they espied a great ship belonging to the Spanish flota which had separated from the rest. This bulky vessel they resolved to set upon and take, or die in the attempt. Hereupon they made sail towards her, with design to view her strength. And, although they judged the vessel to be far above their forces, yet the covetousness of such a prey and the extremity of fortune they were reduced unto, made them adventure upon such an enterprise. Being now come so near that they could not escape without danger of being all killed, the Pirates jointly made an oath unto their captain, Pierre le Grand, to behave themselves courageously in this attempt without the least fear or fainting. True it is that these rovers had conceived an opinion they should find the ship unprovided to fight, and that through this occasion they should master her by degrees. It was in the dusk of the evening, or soon after, when this great action was performed. But, before it was begun, they gave orders unto the surgeon of the boat to bore a hole in the sides thereof, to the intent that, their own vessel sinking under them, they might be compelled to attack more vigorously and endeavour more hastily to run aboard the great ship. This was performed accordingly; and without any other arms than a pistol in one of their hands and a sword in the other, they immediately climbed up the sides of the ship, and ran altogether into the great cabin, where they found the Captain, with several of his companions, playing at cards. Here they set a pistol to his breast, commanding him to deliver up the ship unto their obedience. The Spaniards, seeing the Pirates aboard their ship, without scarce having seen them at sea, cried out: "Jesus bless us! Are these devils or what are they?" In the meanwhile, some of them took possession of the gun-room, and seized the arms and military affairs they found there, killing as many of the ship as made opposition. By which means the Spaniards presently were compelled to surrender. . . .
>
> The planters and hunters of the isle of Tortuga had no sooner understood this happy event, and the rich prize those pirates had obtained, but they resolved to follow their example.[2]

Piracy, directed mainly against the Spaniards, continued to flourish for another thirty years. Woodes-Rogers, appointed Governor of the Bahamas in 1718, managed to stamp it out in the West Indies by dint of a combination of pardons, clemency and hangings. He must have been a rare sea captain to have kept the respect and love of his unruly subjects while carrying out his hard task.

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[1] Esquemeling. The Buccaneers of America. Lond. and N. Y., p. 257–258.

[2] Esquemeling. *Op. cit.*, pp. 56–57.

For the pirate of that day occupied much the place of the rum-runner in this. The law dealt hard with him, but the citizenry were all on his side; he flung his gains about him in Jamaican ports with a profligate hand; merchants, inn-keepers and ladies of the town took his disbursements kindly; officials filled their coffers with his tithes, connived at his escape and hanged him, when they had to, with regret. And as for the pirate himself, he regarded forays upon Spanish towns and the capture of Spanish ships as legitimate enterprise. Why should a scrap of paper turn his hereditary enemy into a *noli me tangere* and outlaw a profession which both governors and governments had used in time of need? A Spaniard was a Spaniard, treaty or none.

Treaties, peace and governors turned respectable buccaneers and privateers into wholly unrespectable pirates. So it is with the habit of man-hunting; once acquired it seems hard to break: the aftermath of 1914–1918 is not so very different.

Wherefore, in spite of Woodes-Rogers, hangings, laws and pursuits, pirates continued to flourish well into the eighteenth century. And seeing that they were to be hanged anyway, they grew less nice about the nationality of their prizes. Every ship was their foe and they were every ship's; they spread from the West Indies and ravaged the Indian Ocean and the African slave coasts. On Madagascar they established settlements and made various ocean islands their strongholds. Captain Avery, who took the Great Mogul's own ship and in her an Indian princess, whose name in the year 1715–1716 was in every man's mouth, a sort of eighteenth century yellow journal hero; Capt. Bartholomew Roberts, who commanded pirate ships from February, 1720, until February 10, 1722, when in a battle with the man-of-war Swallow, "Death, who took a swift passage in a grape shot . . . struck him directly on the throat"; Captain Edward Teach (Blackbeard), one of the most ferocious of pirates, 1717–1718, pet of the Carolinian governor, whom Lieutenant Maynard engaged in fierce hand-to-hand combat in Ockerekoke Inlet, North Carolina, bearing back, hanging from the bowsprit of his sloop, the slain pirate's head; William Kidd, who scarcely merits his renown, a vacillating character who, though he doubtless deserved the hanging that he got, was hanged as a sop to politics; these were the most famous.

It was not law or governments that killed piracy, but steam. Piracy lasted until the beginning of the last century; one of its finest and most generously romantic figures was Jean Lafitte, the Louisianian pirate. During the War of 1812, he was approached by the English; but he scorned their overtures and offered his services to the United States, fighting with his men by the side of General Jackson at the battle of New Orleans. In 1815 he was pardoned by President Monroe in consideration of his services during this battle. Later he made his headquarters in Galveston and, falling again into piracy, was said to have been killed in a fight with a British sloop of war.

Thus we have tried rapidly to sketch the rise and fall of buccaneering and piracy.

The buccaneers were a romantic crew. They took their name from the *boucan*, i.e., jerking meat over a slow smudge, a process they had from the native Caribbees. They lived originally by hunting wild cattle, for which purpose they would disappear from their settlements into the forests of Northern Haiti for a year or more at a time. They were clad in blouses and drawers, black and stiff with the gore of slaughtered cattle. These bloody vestments they never changed but wore as a proud uniform. The achievement of Pierre le Grand suddenly opened their eyes to the fortunes that were sailing away from under their grasp; they saw that cattle rustling was but a slow way of getting rich; and after Pierre's exploit there was a mad rush from the Island of Tortuga into any kind of a vessel that would bear men against the Spaniard. A veritable Klondike rush.

Both buccaneers and pirates were joined in a democratic community, sailing under a code known as the "Jamaica Discipline." They had furthermore a set of articles varying a little under different commanders and in different expeditions.

Captain Bartholomew Roberts' articles read as follows:

CAPTAIN BARTHOLOMEW ROBERTS' ARTICLES

I

Every man has a vote in affairs of moment, has equal title to the fresh provisions or strong liquors at any time seized, and may use them at pleasure, unless a scarcity [no uncommon thing among them] make it necessary for the good of all to vote a retrenchment.

II

Every man to be called fairly in turn by list, on board of prizes, because, over and above their proper share, they were on these occasions allowed a shift of clothes. But if they defrauded the company to the value of a dollar, in plate, jewels, or money, marooning was their punishment. [This was a barbarous custom of putting the offender on shore, on some desolate or uninhabited cape or island, with a gun, a few shot, a bottle of water, a bottle of powder, to subsist with or starve.] If the robbery was only between one another, they contented themselves with slitting the ears and nose of him that was guilty, and set him on shore, not in an uninhabited place, but somewhere where he was sure to encounter hardships.

III

No person to game at cards or dice for money.

IV

The lights and candles to be put out at eight o'clock at night. If any of the crew after that hour still remained inclined for drinking, they were to do it on the open deck. [Which Roberts believed would give a check to their debauches, for he was a sober man himself, but found at length that all his endeavours to put an end to this debauch proved ineffectual.]

V

To keep their piece, pistols and cutlass clean, and fit for service. [In this they were extravagantly nice, endeavouring to outdo one another in the beauty and richness of their arms, giving sometimes at auction at the mast £30 or £40 a pair for pistols. These were slung in time of service, with different coloured ribbons, over the shoulders, in a way peculiar to these fellows, in which they took great delight.]

VI

No boy or woman to be allowed amongst them. If any man were found seducing any of the latter sex, and carried her to sea disguised, he was to suffer death. [So that when any fell into their hands, as it chanced in the Onslow, they put a sentinel immediately over her to prevent ill consequences from so dangerous an instrument of division and quarrel; but then here lies the roguery, they contend who shall be sentinel, which happens generally to one of the greatest bullies, who, to secure the lady's virtue, will let none lie with her but himself.]

VII

To desert the ship or their quarters in battle was punished with death, or marooning.

VIII

No striking one another on board, but every man's quarrels to be ended on shore, at sword and pistol. Thus the quartermaster of the ship, when the parties will not come to any reconciliation, accompanies them on shore with what assistance he thinks proper, and turns the disputants back to back at so many paces distance. At the word of command they turn and fire immediately, or else the piece is knocked out of their hands. If both miss, they come to their cutlasses, and then he is declared victor who draws the first blood.

IX

No man to talk of breaking up their way of living till each had shared £1000. If, in order to do this, any man should lose a limb, or become a cripple in their service, he was to have 800 dollars out of the public stock, and for lesser hurts proportionably.

X

The captain and quartermaster to receive two shares of a prize; the master, boatswain, and gunner, one share and a half, and other officers one and a quarter.

XI

The musicians to have rest on the Sabbath-Day, but the other six days and nights none without special favour.[3]

Captain Ed Low's articles, and also Captain George Lowther's, read:

CAPTAIN LOWTHER'S ARTICLES

I

The Captain is to have two full Shares; the Master is to have one Share and a half; the Doctor, Mate, Gunner, and Boatswain, one Share and a quarter.

II

He that shall be found guilty of taking up any unlawful Weapon on Board the Privateer, or any prize, by us taken, so as to strike or abuse one another, in any regard, shall suffer what Punishment the Captain and Majority of the Company shall think fit.

III

He that shall be found Guilty of Cowardice, in the Time of Engagement, shall suffer what Punishment the Captain and Majority shall think fit.

IV

If any Gold, Jewels, Silver, &c. be found on Board any Prize or Prizes, to the Value of a Piece of Eight, and the Finder do not deliver it to the Quarter-Master, in the Space of 24 Hours, shall suffer what Punishment the Captain and the Majority of the Company shall think fit.

V

He that is found Guilty of Gaming, or Defrauding another to the Value of a Shilling, shall suffer what Punishment the Captain and the Majority of the Company shall think fit.

VI

He that shall have the Misfortune to lose a limb, in Time of Engagement, shall have the Sum of one hundred and fifty Pounds Sterling, and remain with the Company as long as he shall think fit.

VII

Good Quarters to be given when call'd for.

VIII

He that sees a Sail first, shall have the best Pistol, or Small-Arm, on board her.[4]

These articles were in more ways than one the forerunners of the code of modern industrial accident commissions. The wounded and disabled were allowed compensation; and although pirates and buccaneers sailed under the law of "No prey, no pay," the wounded were recompensed out of the common stock before any other division of it was made among the rest of the crew.

They stipulate in writing what recompense or reward each one ought to have that is either wounded or maimed in his body, suffering the loss of any limb, by that voyage. Thus they order for the loss of a right arm 600 pieces-of-eight, or 6 slaves; for the loss of a left arm 500 pieces-of-eight, or 5 slaves; for a right leg 500 pieces-of-eight, or 5 slaves; for a left leg, 400 pieces-of-eight, or 4 slaves; for an eye 100 pieces-of-eight, or one slave; for a finger of the hand the same reward as for the eye."[5]

"In addition to this compensation," Masefield says, "a wounded man received a crown a day (say three shillings) for two months after division of the spoil."[6]

With the buccaneers, the surgeon seems to have had a salary: "Also [they draw out of the common stock] a competent salary for the surgeon and his chest of medicaments, which usually is rated at 200 or 250 pieces-of-eight (dollars)."[7]

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[3] Capt. Chas. Johnson. Quoted in Buccaneers and Marooners of America, ed. and illus. by H. Pyle, Lond., 1897, p. 289–290.

[4] Dow and Edmunds. Pirates of the New England Coast. Salem, Mass., 1923, p. 133.

[5] Esquemeling. *Op. cit.*, p. 60.

[6] Masefield, J. On the Spanish Main. Ed. 2, Lond., 1922, p. 97.

[7] Esquemeling. *Op. cit.*, p. 60.

With the pirates, the surgeon together with the mate, gunner and boatswain drew a share and a quarter of the prize. In ships engaged in legalized privateering the chirurgeon was a regular officer.

> He had to bring on board his own instruments and medicines, and to keep them ready to hand in his cabin beneath the gun-deck, out of all possible reach of shot. He was expected to know his business, and to know the remedies for those ailments peculiar to the lands for which the ship intended. He had to produce a certificate from "able men of his profession" to show that he was fit to be employed. An assistant, or servant, was allowed him, and neither he,nor his servant, did any duty outside of the chirurgeon's province (Monson).[8]

The pirate surgeon, however, does not seem to have had to sign the articles. He was taken off a prize and forced to serve until another prize was taken that had a surgeon on board; he was then given his liberty, if he chose, and the new surgeon put in his place.

Peter Scudamore, Captain Roberts' surgeon, who was hanged at Cape Coast Castle in 1722, gloried in having been the first doctor to sign pirates' articles and in being as staunch and ready a pirate as the rest. We shall have more of Doctor Peter later.

It is touching to see how these rude and bloody men hung upon their doctors; how helpless they felt when cast adrift without one. It gives one a pride in his calling to see how the most arrant rascals among the doctors were honoured, and what privileges and exemptions their doctorate secured to the worst of them. For truly in a professional light, one can see little ground for the pirates' faith and trust. It was a child's and a savage's faith in a medicine-man, in magical healing plaisters and salves. The learnedest of the doctors, the lettered and studied ones among them, seem to have been a lazy, boozing and rascally lot; it was the humbler ones, who had picked up their surgery from apprenticeships, the irregular and unlicensed practitioners, whose meagerly told lives give glimpses of humanity and kindliness and readiness to help.

Before we try to evoke the pictures of a few, of whose lives we have some detail, let me call from Hades the shadowy outlines or a fleeting glimpse, a passage or two in the careers, of some of the dimmer figures among these swashbuckler surgeons.

On the fifth of April of 1680, there landed on the Atlantic side of the Isthmus of Darien a crew of 331 men under seven captains, to wit: Coxon, Harris, Sawkins, Sharp, Cook, Alleston and Macket. The sum of their designs was "to descend by the river of Darien, or any other, into the South Sea, and there to rove up and down until such time as we could meet any rich prize, or galleon coming from Lima to Panama, or else to plunder again either the city of Panama or any other of so many rich towns and villages as are known to border upon the coasts of that sea."[9] After many adventures they reached the shores of the Pacific and embarked toward Panama in a fleet of canoes. They met several Spanish sail, which they captured, and with them blockaded Panama:

> Being almost ready to raise the blockade of Panama, Captain John Coxon [or Croxon] began to vary in his resolutions, and at last openly to mutiny against the rest of the Company: the effect hereof was that he departed from us and returned back with the Emperor and his son King Golden-Cap and all the Indians and canoes they had brought with them, and carrying also with him 50 of our English company and the best surgeon of the fleet, who belonged unto him and who would not go without his instruments to work withal, that is to say the medicaments, which we very much wanted for our wounded men. What medicines he left behind were not considerable in comparison of what he carried away; but this point we knew not till afterwards, or we should have torn in pieces the said surgeon and his master rather than have parted with those things of which we had so much necessity.

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[8] Masefield. *Op. cit.*, p. 254.

[9] Esquemeling. *Op. cit.*, p. 261–262.

> This piece of dishonesty of Captain Coxon weakened much our forces and diminished in great measure our number; for, had he taken care of or carried away our wounded men, we should not much have resented his departure, the Indians being of no considerable help unto us. But here, that he may be known, I will not omit to tell you that the chief occasion of his grudge against us was because we reproached him for his ill-behaviour in the engagement we had with the Armadilla of Panama; for in that dangerous action, to speak it all in a word, he shewed himself more like a coward than one of our profession, that is to say a true Buccaneer. . . . Captain Coxon, who commanded in chief, being separated or departed from us, we chose in his place Captain Sawkins and Captain Sharp to lead us, and were now reduced unto 200 men, whereof many, as was said before, lay dangerously wounded in the hospital vessel.
>
> Having, therefore, refitted ourselves at the island of Tobago, which is situated over-against the road of Panama, we sailed thence about the middle of May, 1680, in quest of some other purchase or design, coasting the shore towards the Northern parts of America commonly called California.[10]

After eight or ten days they arrived at the island of Coiba (Quiblo) and issuing thence attempted the town of Puebla Nueva. Here Captain Sawkins, the best beloved and most valiant of their commanders, in boarding a breast works, was killed. His death gave rise to new dissensions.

About ninety of his party left and returned overland. The remainder sailed along the South American coast and after sundry adventures and dissensions landed on the Isle of Juan Fernandez, where, about Christmas of 1680, they deposed Captain Sharp and elected Captain John Watling in his stead. Watling was a hymn-singing pirate and a precious poor commander; he immediately got his party into trouble and paid for it with his life.

> We landed at Arica, and fought the town with 93 men, which number was all we could conveniently spare. We got into the town and took several of their breast-works, yet were repulsed from the castle, and afterwards beaten out of the town by the country-people, who poured in upon us in huge numbers; so that we were forced to retreat unto our boats, fighting our way through above 1000 men who were gathered against us; this was the hardest shock we had in all the South Sea. Captain Watling, our Commander-in-chief, was here killed; through whose ill-conduct, as it was thought, this misfortune happened unto us. For, had he assaulted the fort in time, before the people and soldiers that ran out of the town were got into it, we had undoubtedly carried all before us. But he trifled away his time in giving quarter and taking prisoners upon the breastworks, till at last we had more prisoners than we could command. We placed some of these prisoners before the front of our men, when we assaulted the castle, just as Sir Henry Morgan did the nuns and friars at Porto Bello, but the Spaniards fired at them as well as at us. In a word, we lost here 40 men, nine of which were taken prisoners, being our surgeons and others, while they were dressing the wounded at the hospital; which loss of our surgeons increased our damage very much, and only 42 or 43 were left serviceable to fight our way through so many hundred of foot and horse unto our boats, we not losing one man by the way, though several were wounded: so much did we awe them with our fuzees, and so afraid were they to break in upon us, though we were almost three miles from our boats. This repulse we resented almost more than any other we ever sustained before, since here was more plate and gold than we could well carry away, by reason it is the embarcadero, or place where all the vast riches that are brought from the mountains of Potosy are shipped off for Panama, whence it goes into Spain. Now Captain Sharp was chosen again, his conduct being thought safer than any other man's, and they having had trial of another leader. Our surgeons we left behind had quarter from the enemy, they being able to do good service in that country; but our wounded men were all knocked on the head, as we understood afterwards. This misfortune fell to us on the 30th of January, being King Charles' Day, as I can remember by some tokens.[11]

A kindly and quiet man, Esquemeling, speaking ill of no one. The truth of the matter we have from the account of Basil Ringrose[12] which is that at the retreat Captain Sharp would have brought off the surgeons "but that they had been drinking while we assaulted the fort, and thus would not come with us when they were called."

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[10] Esquemeling. *Op. cit.*, p. 266–268.

[11] Esquemeling. *Op. cit.*, p. 274–275.

Later, Spanish prisoners told them that the men taken prisoners at Arica were brought to Callao "and very civilly entertained there by all sorts of people, but more especially by the women. That one of our surgeons, whom we suspected to be Mr. Bullock, was left behind, and remained still at Arica." Which shadowy picture is all that is left us of Mr. Bullock and his two nameless fellow surgeons, lying drunk among the wounded in the Pirates' Hospital in that Chilean Coast town, while Watling and his handful were assaulting the fort; still lying there, too drunk to come when called, when the vanquished buccaneers at the end of their hot and bloody day finally fought their way through the choking dust to the beach and to their boats. And at the last, when "examined" (i.e. tortured) by their captors, betraying their comrades by divulging their signals.

> In the meanwhile those of the town examined our surgeons and other men whom they had made prisoners. These gave them our signs that we had left to our boats that were behind us, so that they immediately blew up two smokes, which were perceived by the canoes. This was the greatest of our dangers. For, had we not come at the instant that we did to the sea-side, our boats had been gone, they being already under sail, and we had inevitably perished every man. Thus we put off from the shore, and got on board about ten o'clock at night, having been involved in a continual and bloody fight with the enemy all that day long.[13]

A shameful memory, Mr. Bullock!

With this same expedition was Lionel Wafer, another surgeon, whose figure remains on that faded canvas as one of the gentlest, most whimsical and engaging. On the fateful day at Arica, Wafer was left with the guards at the boats, as a subordinate, preparing salves and plasters for the wounded. When the survivors regained their ship the capture of his drunken superiors left him surgeon-in-chief of what remained of the expedition. They set sail, cruised down the coast and up again. Ill-feeling between the faction which had chosen Watling commander and the Sharp faction continued until April 17, 1681, when off the Isle of Plata (Sir Francis Drake's isle, where he had divided Peruvian plunder among his men by the bowlful) open dissension broke out again and the party split. Forty-seven men, Wafer and the navigator Dampier among them, with five negro slaves and three Indians, set out in open boats for the Isthmus of Darien. Wafer has left an account of this voyage which was originally published in 1699 on his return to London, and has been reprinted several times. An accessible edition, with valuable notes, is that of G. P. Winship.[14] Enough detail can be gathered from this book, and from other accounts of the time to make a fairly coherent picture of Wafer's life. Several moderns have tried their hand at his portrait. R. Scot Skirving[15] wrote an essay on him; Sir Frederick Treves mentions him.[16]

His own delineation and those of his contemporaries will remain the best. The poet John Masefield, in the appendix to his edition of Dampier's Voyages, gives so accurate and concise a sketch of Wafer that to paraphrase it would be an unfair subterfuge. I shall repeat it.

LIONEL WAFER

This writer seems to have passed his youth "at the Navan upon the Boyne, and about the Town of Virginia upon Lough Ranor in the Barony of Castle Raghen in the County of

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[12] Esquemeling. *Op.cit.*, p. 406–409.

[13] Esquemeling. *Op. cit.*, p. 409.

[14] Wafer, L. A New Voyage and Discovery of the Isthmus of America, etc. Ed. by Winship, G. Cleveland, 1903.

[15] Skirving, R. S. *Med. J. Australia*, Sydney April 12, 1924, 1, 358.

[16] Treves. In the Cradle of the Deep. Lond., 1908.

Cavan, and also in the Highlands of Scotland." In a manuscript preserved in the British Museum [Addl. Mss. 33054], he writes as though Wales were his native country, and England the land of his adoption. His parents, or guardians, seem to have been roving people of no position.

Wafer's "first going abroad was in the Great Anne of London, . . . bound for Bantam . . . in the year 1677." He was then "very young" (say 15 or 16), and "in the Service of the Surgeon" as loblolly boy, or dresser. The Great Anne visited Bantam, then sailed to Jamby in Sumatra, and then returned to Bantam to complete her cargo. Wafer seems to have gone ashore at Bantam with the intention of deserting. The Great Anne sailed without him, and he "got a Passage home" aboard a ship called the Bombay. He arrived in England in 1679, stayed a month, and then sailed (as loblolly boy) in a ship bound to Jamaica. He had a brother in Jamaica, employed at Sir Thomas Modyford's plantation at the Angel's. This brother kept him for a while, and then set him up as a surgeon in Port Royal, "where I followed my Business of Surgery for some Months."

Captain Lynch, or Linch, and Captain Edmund Cook, "two Privateers who were going out from Port Royal," persuaded Wafer to join them, as Surgeon. They visited the coasts of Cartagena, and arrived at the Bastimentos, near Porto Bello, in the early spring of 1680, shortly after the second taking of Porto Bello by Sawkins, Coxon, and Sharp. It was here that Wafer first met with Dampier.

Wafer accompanied Edmund Cook upon the march over the Isthmus to the South Seas. He was cruising in the Pacific with Sharp and the other buccaneers aboard the Holy Trinity, until after the battle of Arica, when the company divided. He returned with Dampier's party across the Isthmus; but on "the 5th day of our Journey" his leg was scorched by an explosion of powder; so that he was forced to stay behind among the Indians, with two other buccaneers, who could walk no further. The three were joined soon afterwards by two other stragglers.

Wafer "lived some Months" among the Indians "who in a Manner ador'd him by reason of his skill in Physik and Phlebotomy." He lived, he says, "in great Splendour and Repute"; and he alone, of the five prisoners, was painted "in yellow, red and blue, very bright, and lovely" as a mark of special affection. Eventually the five men reached La Sounds Key, where Captain Tristian took them aboard his cruiser. Wafer sailed under Tristian (having Dampier as a shipmate) for some days, and then went with Dampier, under Captains Wright and Yanky, for a cruise in the West Indies. At Salt Tortuga the two privateers parted company. Dampier stayed with Wright, and Wafer went with Yanky to the "Isle of Ash," or Vacca. Here he left Yanky in order to sail with John Cook (another of Sharp's party who had returned with Dampier) in a newly captured Spanish ship. The French objected that Cook had no commission and that he had no right to command the prize. They plundered the English seamen aboard her and then turned them ashore. Captain Tristian, who happened to be in the anchorage, received "about 8 or 10 of these English: of which number Captain Cook was one, and Captain Davis another," and (we surmise) Lionel Wafer a third. These "8 or 10" waited till Tristian went ashore at Tortuga, and then ran away with his ship, carried her back to Vacca, picked up the rest of the crew, and went a-cruising in her. They took a wine ship, and a ship of eight guns called the Revenge, in which they came to Virginia "about 8 or 9 months after Mr. Dampier came thither" (April, 1683). They fitted up the Revenge as their cruiser, and set sail aboard her August 23, 1683, on the voyage to Sierra Leone (where they took and went aboard the Batchelor's Delight). Wafer, who was one of the chirurgeons of the party, seems to have had a merry time among the African natives, while the Batchelor's Delight refitted. He took part in the adventures in the South Seas with Cook, Davis and the others until August 27, 1687, when Davis and Swan parted company. Dampier stayed with Swan; but Wafer remained in the Batchelor's Delight, under Davis, with whom were Captains Knight and Harris. After visiting Cocos Island, "the Gallapogo's," and "several of the Islands and Coasts of Peru," this squadron took Huavra, Huacho and Pisco. Davis then cruised westward, sighting what may have been Easter Island in the late autumn of 1687. They called at Juan Fernandez (where four men "would needs stay behind") and then sailed round the Horn on their way home. Near the Caribbee Islands, Wafer, Davis and others went aboard a Barbadoes sloop, and sailed in her up the Delaware to Philadelphia, where they arrived in May, 1688. One gathers that they settled in America, at Point Comfort, Va. "But meeting with some Troubles, after a 3 Years' Residence," Wafer returned to England (in the year 1690). The "Troubles" were a charge of piracy, which involved the whole party, and very nearly sent them to the gallows. Their booty (mostly silver) was taken from them, and they were forced to leave the colony; but, after several months in Newgate, in London, they were released (1691) and managed to win back the greater part of their spoil. Wafer was in London in 1697; for he then gave evidence before the Board of Trade and Plantations, concerning the settlement of the Isthmus of Darien. In 1699 he published his "New Voyage and Description," which he dedicated to the Earl of Romney. In or about the year 1700 he drew up a secret memorandum on places fit for settlement in the South Seas. This was done at the instance of the Duke of Marlborough, to whom (in 1704) the second edition of Wafer's book was dedicated. Wafer is said to have died in 1705. He is sometimes spoken of as De la Wafer.[17]

Whatever opinion Wafer himself may have had of the man, posterity has reason to be grateful to the "careless fellow" who scorched our jolly Keltic chirurgeon's knee and robbed him of his jolliness for a time. It was this accident that kept him behind his companions and made him fall into the hands of the Darien Indians and gave us one of the most entertaining of journals.

> It was the 5th Day of our Journey when this Accident befel me; being also the 5th of May, in the Year 1681. I was sitting on the ground near one of our Men, who was drying of Gunpowder in a Silver Plate: But not managing it as he should, it blew up, and scorch'd my Knee to that Degree, that the Bone was left bare, the Flesh being torn away, and my Thigh burnt for a great way above it. I applied to it immediately such Remedies as I had in my Knapsack: And being unwilling to be left behind by my Companions, I made hard shift to jog on, and bear them Company for a few Days; during which our Slaves ran away from us, and among them a Negro whom the Company had allow'd me for my particular Attendant, to carry my Medicines. He took them away with him, together with the rest of my Things, and thereby left me deprived of wherewithal to dress my Sore; insomuch that my Pain increasing upon me, and being not able to trudge it further through Rivers and Woods, I took leave of my Company, and set up my Rest among the Darien Indians.
>
> This was on the 10th Day; and there staid with me Mr. Richard Gopson, who had served an Apprenticeship to a Druggist in London. He was an ingenious Man, and a good Scholar; and had with him a Greek Testament which he frequently read, and would translate extempore into English to such of the Company as were dispos'd to hear him. Another who staid behind with me was John Hingson, Mariner: They were both so fatigued with the Journey, that they could go no further. There had been an Order made among us at our first Landing, to kill any who should flag in the Journey: But this was made only to terrify any from loitering, and being taken by the Spaniards; who by Tortures might extort from them a Discovery of our March. But this rigorous Order was not executed; but the Company took a very kind Leave both of these, and of me. . . .
>
> Being now forc'd to stay among them, and having no means to alleviate the Anguish of my Wound, the Indians undertook to cure me; and apply'd to my Knee some Herbs, which they first chew'd in their Mouths to the consistency of a Paste, and putting it on a Plantain-Leaf, laid it upon the Sore. This proved so effectual, that in about 20 Days use of this Poultess, which they applied fresh every Day, I was perfectly cured; except only a Weakness in that Knee, which remained long after, and a Benumbness which I sometimes find in it to this Day. Yet they were not altogether so kind in other respects; for some of them look'd on us very scurvily throwing green Plantains to us, as we sat cringing and shivering, as you would Bones to a Dog.[18]

With Wafer were four other men. One more was drowned while swimming a river with a line about his neck, "the stream running very swift and the man having three hundred dollars at his back, was carried down, and never seen more by us." His companions roaming the woods to rejoin Wafer "saw him lie dead on the

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[17] Masefield, J. Dampier's Voyages. 1, 536–538.

[18] Wafer, *Op. cit.*, p. 36–39.

Shore which the Floods were gone off from, with the Rope twisted about him, and his Mony at his Neck; but they were so fatigued, they car'd not to meddle with it."[19] Wafer apologized for the Indians' harsh treatment:

> Not that they were naturally inclin'd to use us thus roughly for they are generally a kind and free-hearted People; but they had taken some particular Offence, upon the account of our Friends who left us, who had in a manner awed the Indian Guides they took with them for the remainder of their Journey, and made them go with them very much against their Wills.[20]

The smaller party of stragglers found a Spanish-speaking Indian who brought them food by stealth, and kept them while their captors, fearful that the two Indians forced by Dampier and the rest of the party to act as guides might have come to harm, debated whether to kill them or not.

> But it so hapned that Lacenta, their Chief, passing that way, dissuaded them from that Cruelty, and proposed to them to send us down towards the North-side, and two Indians with us, who might inform themselves from the Indians near the Coast, what was become of the Guides. They readily hearken'd to this Proposal and immediately chose two Men to conduct us to the North-side.[21]

They kept their guides for three days, when their scanty provision being spent, these returned home again and left Wafer and his companions to shift for themselves. Starving, they floundered about in the rainy woods and camped by swollen streams for eight days.

> The Night was still very dark, but only when the flashes of Lightning came: Which made it so dreadful and terrible, that I forgot my Hunger, and was wholly taken up with praying to God to spare my Life. While I was Praying and Meditating thus on my sad Condition, I saw the Morning Star appear, by which I knew that Day was at hand: This cheared my drooping Spirits, and in less than half an hour the Day began to dawn, the Rain and Lightning ceas'd and the Waters abated.[22]

After many mishaps they turned about and rejoined the Indians at the same camp from which they had set out. They were well received; the two Indian guides had returned safely and had been well used.

> We had not been long here before an Occurence happen'd, which tended much to the increasing the good Opinion Lacenta and his People had conceiv'd of us, and brought me into particular Esteem with them.
>
> It so happen'd, that one of Lacenta's Wives being indisposed, was to be let Blood; which the Indians perform in this manner: The Patient is seated on a Stone in the River, and one with a small Bow shoots little Arrows into the naked Body of the Patient, up and down; shooting them as fast as he can, and not missing any part. But the Arrows are gaged, so that they penetrate no farther than we generally thrust our Lancets: And if by chance they hit a Vein which is full of Wind, and the Blood spurts out a little, they will leap and skip about, shewing many Antick Gestures, by way of rejoycing and triumph.
>
> I was by while this was performing on Lacenta's Lady: And perceiving their Ignorance, told Lacenta, That if he pleased I would shew him a better way, without putting the Patient to so much Torment. Let me see, says he; and at his Command, I bound up her Arm with a piece of Bark, and with my Lancet breathed a Vein: But this rash attempt had like to have cost me my Life. For Lacenta seeing the Blood issue out in a Stream, which us'd to come only drop by drop, got hold of his Lance, and swore by his Tooth that if she did otherwise than well, he would have my Heart's Blood. I was not moved, but desired him to be patient, and I drew off about 12 Ounces, and bound up her Arm, and desired she might rest till the next Day: By which means the Fever abated, and she had not another Fit. This gained me so much Reputation, that Lacenta came to me, and before all his Attendants, bowed, and kiss'd my Hand. Then the rest came thick about me, and some kissed my Hand, others my Knee, and some my Foot: After which I was taken up into a Hammock,

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[19] Wafer, p. 41.

[20] Wafer, p. 40.

[21] Wafer, p. 42.

[22] Wafer, p. 48.

and carried on Men's Shoulders, Lacenta himself making a Speech in my Praise, and commending me as much Superior to any of their Doctors. Thus I was carried from Plantation to Plantation, and lived in great Splendor and Repute, administering both Physick and Phlebotomy to those that wanted. For tho' I lost my Salves and Plaisters, when the Negro ran away with my Knapsack, yet I preserv'd a Box of Instruments, and a few Medicaments wrapt up in an Oil-Cloth, by having them in my Pocket, where I generally carried them.

I lived thus for some Months among the Indians, who in a manner ador'd me . . ."[23]

After this Wafer had as hard a time in getting away from his new friends as he had had in first ingratiating himself with them. Finally he pictured to Lacenta the great advantages of English hunting dogs and offered to bring him a few from England if he would but allow him to go and get them.

> Lacenta . . . demurred at this Motion a while; but at length he swore by his Tooth, laying his Fingers on it, That I should have my Liberty and for my Sake the other four with me; provided I would promise and swear by my Tooth, that I would return and live among them; for he had made me a promise of his Daughter in Marriage, but she was not then marriageable. I accepted of the Conditions: and he further promised, that at my return he would do for me beyond my Expectation.[24]

So under the convoy of seven lusty fellows, Wafer and his four companions made their way to the coast, where arriving they found the first part of the expedition lying with two ships.

> We went aboard the English Sloop, and our Indian Friends with us, and were received with a very hearty welcome. The four English Men with me were presently known and caress'd by the Ships Crew; but I sat a while cringing upon my Hams among the Indians, after their Fashion, painted as they were, and all naked but only about the Waist, and with my Nose-piece (of which more hereafter) hanging over my Mouth. I was willing to try if they would know me in this Disguise; and 'twas the better part of an Hour before one of the Crew, looking more narrowly upon me, cry'd out, Here's our Doctor; and immediately they all congratulated my Arrival among them. I did what I could presently to wash off my Paint, but 'twas near a Month before I could get tolerably rid of it, having had my Skin so long stain'd with it, and the Pigment dried on in the Sun: And when it did come off, 'twas usually with the peeling off of Skin and all. As for Mr. Gopson, tho' we brought him alive to the Ship, yet he did not recover his Fatigues, and his drenching in the Water, but having languish'd aboard about three Days, he died there at La Sound's Key.[25]

Thus ends the account of his travels over the Isthmus. In the succeeding chapters of his journal he relates of Isthmian animals, trees and plants, of the Indians and their customs, and adds a short vocabulary of their language.

He evidently does not wish his book to compete with or duplicate the journal of his old shipmate Dampier, published a few years before. He confines his account to territory which he explored apart from Dampier; he adds a final chapter on his travels with Captain Davis in the Batchelor's Delight, Dampier having gone with Captain Swan in the Cygnet.

> We left them in the Harbour of Realeja, when we set out Aug. 27, 1685, with three other Vessels in our Company. But our Men growing very sick when we were got out to Sea, we soon put into the Gulph of Amapalla. There we lay several Weeks at a small Island, on which we built Huts for our sick Men, whom we put ashore. In our 4 small Ships, we had then above 130 sick of the Spotted Fever, many of whom died: Yet tho' I attended them every Day, I thank God I escap'd the Infection.[26]

They travelled up and down the Chilian and Peruvian Coast and took various towns. At Vermejo, seeking for water, they landed at a sandy Bay, where they found the beach "covered with the Bodies of Men, Women, and Children; which lay so thick, that a Man might, if he would, have walked half a Mile, and never trod a step off a dead human Body. These Bodies, to appearance, seem'd as if they had not been above a Week dead; but if you handled them, they prov'd as dry and light as a Spunge or piece of Cork."[27]

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[23] Wafer, p. 54–55.

[24] Wafer, p. 58.

[25] Wafer, p. 64–65.

[26] Wafer, p. 173.

They asked an old Indian how these bodies came there. In his father's time, the Indian said, the soil had been well cultivated and fruitful, but when the Spaniards came and blocked up and laid siege to the city, the Indians, rather than lie at the Spaniards' mercy, dug holes in the sand and buried themselves alive.

> The Men as they now lie, have with them their broken Bows; and the Women their Spinning-wheels, and Distaffs with Cotton-yarn upon them. Of these dead Bodies I brought on board a Boy of about 9 or 10 Years of Age, with an intent to bring him home for England: But was frustrated of my purpose by the Sailors; who having a foolish Conceit, that the Compass would not traverse aright, so long as any dead Body was on board, threw him overboard, to my great Vexation.[28]

They rounded the Horn in a great storm, coasted along Brazil and had made the Caribbee Islands when they heard of King James' pardon to the buccaneers. Wafer and some others took advantage of it and sailed up the Delaware to Philadelphia. From here they carted their "Chests and other Goods" overland to Chesapeake Bay, thinking to settle on the James River in Virginia. "But meeting with some Troubles, after a three years residence there, I came home for England, in the year 1690." The troubles, as Masefield says, were charges of piracy. Perhaps their "Chests and other Goods" had something to do with them.

Thus ends Wafer's journal. A kindly, helpful, jolly, whimsical man: seeing the best in his fellows, condoning their faults, speaking ill of no one; ready at a prank and masquerading as an Indian in paint and feathers when he rejoins his ship after all his mishaps—a true Gael; a good naturalist and observer, writing sensibly and entertainingly of llamas and ostriches and other beasts, birds and plants; a generous and loyal man, yielding in his writings to his difficult and cantankerous shipmate Dampier; trusty and helpful, nursing 130 sick with spotted fever and thanking God he escaped the infection; a proper good doctor to help a company of rovers through unknown tropical forests, sickness and battles with man and Nature.

We owe most of our knowledge of the buccaneers to the excellent historian Esquemeling, another surgeon and colleague: an uncommonly well-balanced and unimpassioned person, an ideal narrator. Of his own life he has left us but a few flimsy threads, nor do we find mention of him in other writers of the time. We know next to nothing of his career, or where and how he lived and died, but his character we can fill in from his writings. "The Buccaneers of America: a True Account of the most remarkable Assaults committed of late years upon the coast of the West Indies by the Buccaneers of Jamaica and Tortuga, both English and French wherein are contained more especially the unparalleled Exploits of Sir Henry Morgan, our English Jamaican Hero, who sacked Porto Bello, burnt Panama, etc.

"Written originally in Dutch by John Esquemeling one of the Buccaneers who was present at these tragedies.

"Translated into Spanish by Alonso de Bonne-Maison, M.D., etc. Now faithfully rendered into English with Facsimiles of all the original Engravings, Maps, etc. Translation of 1684–5."

This book was originally written in Dutch and published in Amsterdam in 1678 under the title of "De Americaensche Zeerovers." It was soon translated into English and passed through several editions, many of them amended and changed by the publisher to save the renown of some of the more popular English heroes, especially Sir Henry Morgan. A new edition by Wm. Swan Stallybrass has been issued in the Broadway translations.[29]

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[27] Wafer, p. 186.

[28] Wafer, p. 187.

[29] Lond. and N. Y.

Esquemeling set sail, he says, from Havre-de-Grace in France in a ship called the St. John, on the second of May, 1666, and landed at Tortuga, near Haiti, on the seventh of July of the same year. Tortuga had been captured from the Spanish by French buccaneers, and a governor had been sent them by the governor of the French colony of St. Christopher. In 1664 this governor was dispossessed by the French West India Company who sent a governor of their own, a Monsieur Ogeron. Under charter of the French government the Company thought to have a monopoly of trade with the hunters, buccaneers and planters, inhabitants of the island, and also to drive trade with the Spanish, as the Dutch did at Curaçao. This design was a failure, for the factors of the Company soon found that they could not "recover either moneys or returns from these people." They sent out armed men and tried to make their collections by force, a futile scheme.

> And hereupon the Company recalled their factors, giving them orders to sell all that was their own in the said plantation, both the servants belonging to the Company (which were sold, some for 20, others for 30, pieces-of-eight), as also all other merchandizes and properties which they had there. With this resolution all their designs fell to the ground.
>
> In this occasion I was also sold, as being a servant under the said Company, in whose service I came out of France. But my fortune was very bad, for I fell into the hands of the most cruel tyrant and perfidious man that ever was born of woman, who was then Governor, or rather Lieutenant-General, of that island. This man treated me with all the hard usages imaginable, yea, with that of hunger, with which I thought to have perished inevitably. Withal he was willing to let me buy my freedom and liberty, but not under the rate of 300 pieces-of-eight, I not being master of one, at that time, in the whole world. At last through the manifold miseries I endured, as also affliction of mind, I was thrown into a dangerous fit of sickness. This misfortune, being added to the rest of my calamities, was the cause of my happiness. For my wicked master, seeing my condition, began to fear lest he should lose his moneys with my life. Hereupon he sold me the second time to a surgeon for the price of 70 pieces-of-eight. Being in the hands of this second master, I began soon after to recover my health through the good usage I had received from him as being much more humane and civil than that of my first patron. He gave me both clothes and very good food, and after that I had served him but one year he offered me my liberty, with only this condition, that I should pay him 100-pieces-of-eight when I was in a capacity of wealth so to do. Which kind proposal of his I could not choose but accept with infinite joy and gratitude of mind.
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> Being now at liberty, though like unto Adam when he was first created by the hands of his Maker—that is, naked and destitute of all human necessaries, nor knowing how to get my living—I determined to enter into the wicked order of the Pirates, or Robbers at Sea. Into this Society I was received with common consent both of the superior and vulgar sort, and among them I continued until the year 1672. Having assisted them in all their designs and attempts, and served them in many notable exploits of which hereafter I shall give the reader a true account, I returned to my own native country.[30]

This is all we have of his personal history. His book is incomparable. It is the sole record of older and later buccaneers, of Frenchmen and Portuguese of an unthinkable savagery; of L'Olonnois, who tore the living heart from his Spanish victim's breast and gnawed at it in his rage; of the later race of Mansvelt, Sir Henry Morgan, Sawkins, Harris and Cook, Wafer's captains and comrades. It is a faithful and minute chronicle of buccaneer customs, codes and government; it records the bloodiest and most ferocious ravages with the same Flemish tranquillity with which it recounts the habits of West Indian birds and fishes; it breathes withal a steady Lutheran spirit of Christianity. This peaceful Flemish surgeon-apprentice found no pleasure in the savagery of his French shipmates, but he left us an extraordinary chronicle of them.

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[30] Esquemeling. *Op. cit.*, p. 21–22.

He was with Morgan in his sack of Panama; he was deserted by him later, when Morgan stole off with the booty, cheating his fellow buccaneers of their legitimate shares.

What became of him or where he died we do not know. He has but the two paragraphs quoted above of himself, others mention him only to quote from his writings. His must have been a gentle, kindly and modest nature. Even those who injured him he seeks to excuse.

These two buccaneers, Wafer and Esquemeling, have been preserved to us as historians rather than surgeons. Neither appears to have had a degree, both learned their professions not at schools but by apprenticeship to surgeons whose names are lost to us. Unless perhaps the tipsy Mr. Bullock was Wafer's master.

A third seafaring doctor's name is preserved in a powder rather than by his navigations. And justly so, for the powder has stood the test of time.

Osler has written a delightful essay on this man: I shall refer you to it[31] and spare you lengthy detail concerning Dr. Dover, sea rover and originator of the pulv. ipecac. et opii comp. A squabbling, irascible, Paracelsian character, with considerable of the mountebank even for those eighteenth century days; author of a medical manual for laymen; always ready to pick a quarrel with his colleagues; an opinionated stubborn man. Yet let us given him his due: his love of adventure was such that at the age of forty-eight he gave up his practice in Bristol, fitted out a privateering expedition and set out on it himself. His book is entitled "The Ancient Physician's Legacy to his Country, Being what he has collected in Forty-Nine Years' Practice: or an Account of the several Diseases incident to Mankind, in so plain a Manner, that any Person may know the Nature of his own Distemper, and the several Remedies proper for it, wherein the extraordinary Effects of Mercury are more particularly consider'd. Design'd for the Use of all Private Families. By Thomas Dovar, M.D. with Remarks on the Whole by a Learned Physician. To which is added (being a proper Supplement to the Work) a New Translation of a Treatise of Mercury, and the Wonderful Cures performed by it; written by the Learned Belloste, Author of the Hospital Surgeon. With a complea't Index to the whole. London. Printed for the Relict of the late R. Bradly. 1733."

The old man (he was seventy-two or seventy-three when he wrote the book) held no mean opinion of himself:

> If travelling be necessary to make an accomplished Physician, I am very sure that I have travelled more than all the Physicians in Great-Britain put together.
>
> But I am going a little out of my Way, and shall therefore return to what I at first proposed; wherein, if I fall short, I shall yet please myself in my sincere Design of being beneficial to Mankind. All I desire of those who find fault with my Performance, is to produce a better in its Room.[32]

He was no timid therapeutist:

> When we took the two Cities of Guaiaquil, under the Line, in the South-Sea it happened, that not long before the Plague had raged amongst them. For our better Security therefore, and keeping our People together, we lay in their Churches; and likewise brought thither the Plunder of the Cities: We were very much annoyed with the Smell of dead Bodies. These Bodies could hardly be said to be buried; for the Spaniards abroad use no Coffins, but throw several dead Bodies one upon another; with only a Draw-Board over them; so that 'tis no Wonder we received the Infection.
>
> In a very few Days after we got on Board, one of the Surgeons came to me to acquaint me, that several of my Men were taken after a so violent Manner with the Langour of Spirits, that they were not able to move. I immediately went among them, and to my great Surprise soon discerned what was the Matter. In less than forty-eight Hours we had in our several Ships one hundred and eighty Men in this miserable Condition.

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[31] Osler, Sir W. An Alabama Student and Other Biographical Essays. Oxford, 1908.

[32] Dover, p. 7–8.

> I ordered the Surgeons to bleed them in both Arms, and to go round to them all, with Command to leave them bleeding till all were blooded, and then come and tie them up in their Turns. They lay bleeding and fainting, so long, that I could not conceive they could lose less than an hundred Ounces each Man. . . . So that notwithstanding we had one hundred and eighty odd down in this most fatal Distemper, yet we lost no more than seven or eight; and even these owed their Deaths to the strong Liquors which their Mess-Mates procured for them.
>
> They had all Spots, which in the great Plague they call Tokens; few or none of the Spaniards escaped Death that had them; but my People had them, and Buboes too.
>
> Now if we had had Recourse to Alexipharmicks, such as Venice Treacle, Diascordium, Mithridate, and such like good-for-nothing Compositions, or the most celebrated Gascoin's Powder, or Bezoar, I make no Question at all, considering the Heat of the Climate, but we had lost every man.[33]

This passage called down the gibe that Osler mentions:

> I think the Doctor had much better left out his Bravado of having taken two cities by storm, unless he thinks it an honour to a Physician to kill and slay, and after to plunder the Innocent, those who never wronged him, and to carry off the spoil; a good prelude, this, to the blood shed after among his own men.[34]

The doctor himself considered the copious use of native quicksilver as his chief legacy. As addenda to his book there are a number of testimonials: thus his obliged humble servant Benj. Benson, who suffered from scorbutic humours and a white scurf on the hands in the spring, writes from Piccadilly on May 10, 1739, to say that he had taken in all some five pounds of the crude mercury and believed it to be "the best Remedy in obstinate chronick Diseases, and nothing more pleasant and agreeable."

Dover's medical portrait is scarcely a venerable one: he had, as Osler says, the wit to compound a good powder, but he apparently held it in no particular esteem. He thought more highly of more violent remedies; he lacked the genius of a Paracelsus or even common sense; no foundation of usefulness underlay his mountebankery.

Let us leave Dr. Dover. Captain Dover is more entertaining..

The expedition in which he sailed from Bristol was well financed, well equipped and well planned. And it was no fault, but rather the effect of wisdom, forethought and cautiousness, if it lacked some of the savor of romance and adventure that fired the expeditions of the earlier buccaneers. The venture was unusually successful: far from returning bankrupt, as that incomparable naturalist, scientist and navigator, but mighty poor pirate Dampier had, it brought back a booty of £170,000.

It was financed by Bristol men, among them Dr. Dover; it was commanded by Captain Woodes-Rogers, afterward governor of the Bahamas, than whom there was no better commander. With them sailed Dampier, whose knowledge of the art of navigation, of winds, tides and currents, and of the geography of the South Seas was unequalled. The doctor took the title of captain and sailed as third in command; "as owner of a very considerable share of both vessels, he was President of the Council and had a double voice in the deliberations." (Osler.) In October, 1701, they sailed from Bristol for the South Seas (the Pacific) in two ships, the Duke and Duchess.

On February 1, 1710, they sighted the Island of Juan Fernandez off the Chilean coast; the next day Captain Dover, with a Mr. Fry and six men, went ashore and discovered Alexander Selkirk, the original of Robinson Crusoe, a man who had been left on the Island four and a half years before by Captain Stradling of the Cinque-Portes. Dampier had sailed in this vessel and had known the man. I shall not quote Captain Woodes-Rogers' account of this discovery. Osler repeats it in full.

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[33] Dover, p. 67–69.

[34] Turner, D. Quoted by Osler, Sir W. *Johns Hopkins Hosp. Bull.*, Balt., 1896, VII, 5.

Here is adventure enough to justify remembering this old Bristol privateer-doctor. But he did not only this. Later he led an assault on Guayaquil and captured it; and later still he was given command of a prize-ship, renamed the Batchelor, now truly Captain Dover. Where he learned his navigation does not appear, but he must have been a competent commander to have held an independent position in a company that included Captain Woodes-Rogers and Dampier.

Your memory therefore is assured, Captain Dover, even though your powder and quicksilver, Dr. Dover, be forgotten. Robinson Crusoe, Defoe and Captain Woodes-Rogers have saved you.

Thomas Lodge, sea rover and poet, was not strictly a buccaneer doctor. He studied medicine later, after he left the sea. He was born about 1557; his father was Sir Thomas Lodge, grocer and Lord Mayor of London in 1563. The Encyclopedia Brittanica has an essay on him, ready to every man's hand. He was educated at the Merchant Tailors' School and at Trinity College, Oxford. Between 1584–1590 he engaged in more than one free-booting expedition to the Spanish Main. On August 26, 1591, he sailed from Plymouth for Brazil with Sir Thomas Cavendish in the galleon Desire. The tale of the expedition is full of misery. They took the town of Santos while the people were at Mass but got nothing.

> Such was the negligence of our governor master Cocke, that the Indians were suffered to carry out of the towne whatsoever they would in open viewe, and no man did controll them: and the next day after wee had wonne the towne, our prisoners were all set at libertie, onely foure poore olde men were kept as pawnes to supply our wants. Thus in three dayes the towne that was able to furnish such another Fleete with all kinde of necessaries, was left unto us nakedly bare, without people and provision.
>
> Eight or tenne dayes after master Candish himselfe came thither, where hee remained untill the 22. of January, seeking by intreatie to have that, whereof we were once possessed. But in conclusion wee departed out of the towne through extreeme want of victuall, not being able any longer to live there, and were glad to receive a few canisters or baskets of Cassavi meale; so that in every condition wee went worse furnished from the towne, then when wee came unto it. The 22. of January we departed from Santos, and burnt Sant Vincent to the ground. The 24. we set saile, shaping our course for the Streights of Magellan.[35]

At Santos Lodge took up his quarters with some others of the English in the Jesuit College, and spent five weeks there among the books in the Father's library. From March until December they cruised about Patagonia and the Straits of Magellan, struggling with hunger, disease and mutiny:

> In the which time wee indured extreeme stormes, with perpetual snow, where many of our men died with cursed famine, and miserable cold, not having wherewith to cover their bodies, nor to fill their bellies, but living by muskles, water, and weeds of the sea, with a small reliefe of the ships store in meale sometimes. And all the sicke men in the Galeon were most uncharitably put a shore into the woods in the snowe, raine, and cold, when men of good health could scarcely indure it, where they ended their lives in the highest degree of misery, master Candish all this while being abord the Desire.[36]

Here the unruffled poet wrote his romance "Marguerite of America."

The expedition reached Ireland June 11, 1593. They had victualled their ship with dried penguins; on the return voyage, as they came "neere unto the sun, our dried Penguins began to corrupt, and there bred in them a most lothsome & ugly worme of an inch long."

> This worme did so mightily increase, and devoure our victuals, that there was in reason no hope how we should avoide famine; but be devoured of these wicked creatures: there was nothing that they did not devour, only yron excepted: our clothes, boots, shooes, hats, shirts, stockings: and for the ship they did so eat the timbers, as that we greatly feared they would

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[35] Hakluyt. Everyman Ed., VIII, 289–290.

[36] Hakluyt. VIII, 291.

undoe us, by gnawing through the ships side. Great was the care and diligence of our captaine, master, and company to consume these vermine, but the more we laboured to kill them, the more they increased; so that at the last we could not sleepe for them, but they would eate our flesh, and bite like Mosquitos. In this wofull case, after we had passed the Equinoctiall toward the North, our men began to fall sick of such a monstrous disease, as I thinke the like was never hearde of: for in their ankles it began to swell; from thence in two daies it would be in their breasts, so that they could not draw their breath, and then fell into their cods; and their cods and yardes did swell most grievously, and most dreadfully to behold, so that they could neither stand, lie, nor goe. Whereupon our men grew mad with griefe. Our Captain with extreme anguish of his soule, was in such wofull case, that he desired only a speedie end, and though he were scarce able to speak for sorrow, yet he perswaded them to patience, and to give God thanks, & like dutifull children to accept of his chastisement. For all this divers grew raging mad, & some died in most lothsome & furious paine. It were incredible to write our misery as it was: there was no man in perfect health, but the captain & one boy. The master being a man of good spirit with extreme labour bore out his griefe, so that it grew not upon him. To be short, all our men died except 16, of which there were but 5 able to moove. The captaine was in good health, the master indifferent, captaine Cotton and my selfe swolne and short winded, yet better than the rest that were sicke, and one boy in health: upon us 5 only the labour of the ship did stand. The captaine and master, as occasion served, would take in, and heave out the top-sailes, the master onely attended on the sprit-saile, and all of us at the capstan without sheats and tacks. In fine our miserie and weaknesse was so great, that we could not take in, nor heave out a saile: so our top-saile and sprit-sailes were torne all in pieces by the weather. The master and captaine taking their turnes at the helme, were mightily distressed and monstrously grieved with the most wofull lamentation of our sick men. Thus as lost wanderers upon the sea, the 11 of June 1593, it pleased God that we arrived at Bearhaven in Ireland, and there ran the ship on shore.[37]

This voyage seems to have turned the venturous poet from sailoring to the gentler business of medicine. He went to Avignon where he graduated in 1600, at the age of forty. He wrote a treatise on the plague (1603) and died of this disease in 1625, aged sixty-eight, medicine having brought him more success than had the sea.

Beside Lodge and Dover, and the two rover surgeons Wafer and Esquemeling, whose works of travel have kept their names alive, there is a host of others concerning whose lives we have to look to contemporary writings. Some of them hold the buccaneer stage long enough to provoke compassion, admiration, or a smile; more of them flit by, dim names, or nameless shadows. Many of them are mentioned in connection with various diseases and scourges that beset the fleets; others have come down to us for deeds of piracy or daring; others, sad to say, for their faults. The names are many: one might without much trouble list them in a medico-piratical encyclopedia, as Philip Gosse has done for the buccaneers.

Among the early ones is Nicholas Millechap, Sir Walter Raleigh's surgeon on his first voyage to Guiana in the Lion's Whelp (1595). "Our chirurgeon, Nicholas Millechap, brought me a kind of stones like sapphires; what they may prove I know not," he says.

Sir Walter Raleigh lost the surgeon of his unfortunate second voyage while off the Island of Santiago (Cape Verde Islands). "Monday being Michaelmas Day (September 29, 1617), then died our Master Surgeon, Mr. Nubal, to our great loss; . . . and we had 60 men sick, and all mine own servants amongst them, that I had none of mine own but my pages to serve me."

Of Sir Francis Drake's surgeons I can find but little. His expeditions were conducted with much secrecy and intrigue. The accounts of the deeds of this most glorious of all sea rovers are fragmentary and contradictory. Soon after his death his adventures shone with a halo of myth, like those of King Arthur, and the lesser lights of his medical men were put out by the effulgence of the sun about which their orbits revolved. On his glorious third voyage to the Spanish Main (1572), in which he first viewed the Pacific, he carried with him a doctor who seems not to have been a "great proficient" in his art (Masefield). While off the Isthmus of Panama at Fort Diego, a day or two after New Year of 1573, "half a score of our Company fell down sick together, and the most of them died within two or three days." They called the sickness a calenture and attributed it to the sudden change from cold to heat or to the brackish water they took on board, more likely the latter. Thirty of the men were down with it at one time; among the dead was Joseph Drake, brother of Sir Francis, "who died in our Captain's arms." Drake, to stop the panic among his men and "that the cause of the disease might be better discerned, and consequently remedied" had the surgeon open his brother's corpse. The surgeon "found his liver swollen, his heart as it were sodden, and his gut all fair." "This was the first and last experiment that our Captain made of anatomy in this voyage." The surgeon who made the examination "overlived him not past four days," a fact which, Masefield maliciously but perhaps not untruthfully adds, very possibly saved the lives of half the company.

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[37] Hakluyt. VIII, 310–311.

> He had had the sickness at its first beginning among them, but had recovered. He died, we are told, "of an overbold practice which he would needs make upon himself, by receiving an overstrong purgation of his own device, after which taken he never spake; nor his Boy recovered the health which he lost by tasting it, till he saw England." He seems to have taken the draught directly after the operation, as a remedy against infection from the corpse. The boy, who, perhaps, acted as assistant at the operation, may have thought it necessary to drink his master's heeltaps by way of safeguard.[38]

His nephew and namesake's description of his (fifth) great voyage around the world, entitled "The World Encompassed" (Hakluyt Society's Publications) contains a note on Drake's doctors. It was on this voyage that Drake, continuing up the West Coast of America, discovered California, naming it New Albion. At Drake's Bay near Bolinas he landed and nailing to a tree a leaden tablet with the name of Queen Elizabeth scratched on it, took possession for his sovereign.

The doctors are mentioned in the description of an affray on an island off the Chilean Coast, after the Golden Hind had weathered the Straits of Magellan. The note reads:

> The rest, being nine persons in the boat were deadly wounded in divers parts of their bodies, if God almost miraculously had not given cure to the same. For our chief surgeon being dead and the other absent by the losse of our Vice-Admirall, and having none left us but a boy, whose good will was more than any skill hee had, wee were little better than altogether destitute of such cunning and helpes as so grievous a state of so many wounded bodies did require.[39]

On Drake's last voyage his chief surgeon was James Wood. Touching at the Canary Isles on this voyage, the surgeon of one of the fleet's ships, the Solomon, went up a hill with six or seven companions to fetch water. They were set upon by herdsmen with staves and the captain and three or four of the party were killed; the surgeon was taken prisoner "who disclosed our pretended voyage as much as in him lay; so as the Viceroy sent a caravel of adviso into the Indies, with all such places as wee did pretend to goe to."

Immediately upon reaching the West Indies, dysentery broke out among them. The vice-admiral, Sir John Hawkins, was among the first to die of it. The chief surgeon Wood died January 27, 1596 off Puerto Bello; Drake followed him the next day and was buried on an island off the coast of Panama, a fit resting place for the greatest of captains of the sea.

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[38] Masefield. *Op. cit.*, p. 42.

[39] Drake, F. The World Encompassed. Pub. by Hakluyt Soc., p. 98.

With the later rovers, the real buccaneers, there sailed a host of surgeons, named and nameless; some rascals, some jolly figures, some serious minded men, with an eye to the main chance. A diverting trail to follow.

Among the nameless ones is the surgeon of Pierre-le-Grand, pioneer buccaneer. Pierre made sure that there was to be no retreat (*vid. supra*) when his band swarmed aboard the Spanish galleon; he entrusted the task of scuttling his abandoned boat to his medico, whose dependability with the augur may have exceeded his courage.

Another nameless one was the surgeon of M. Ogeron, governor of Tortuga. In 1673, during the war between France and Holland, M. Ogeron joined forces with a French fleet with the intention of proceeding against the Dutch West Indies. They sailed for Curaçao, but were shipwrecked on the shores of Porto Rico, many of them were killed by the Spaniards and the rest taken prisoners, M. Ogeron among them. "He kept himself very close to all the features and mimical actions that might become any innocent fool. Upon this account he was not tied like the rest of his companions, but let loose, to serve the divertisement and laughter of the common soldiers."

> It happened there was found among the French Pirates a certain surgeon, who had done some remarkable services to the Spaniards. In consideration of these merits, he was unbound and set at liberty, to go freely up and down, even as Monsieur Ogeron did. Unto this surgeon Monsieur Ogeron, having a fit opportunity thereunto, declared his resolution of hazarding his life to attempt an escape from the cruelty and hard usage of those enemies.[40]

Ogeron and his surgeon fled into the woods, and after many hardships built a canoe, with which they crossed to Haiti, landing in Samana. Here Ogeron "gave orders unto the surgeon to levy all the people he could possibly in those parts while he departed to revisit his government of Tortuga."[41] He embarked the forces which his surgeon had gathered at Samana and again set out for Porto Rico. The Spaniards had been apprised of this new expedition; they laid an ambuscade and destroyed the greater part of the force. The remainder they took prisoners and transported them to Europe by degrees, in order to disperse them. Many of them, however, worked their way back to Tortuga again and undertook a new expedition against the Spanish and Dutch, this time with better success.

A serious-minded man, yet not untouched by human foibles nor even by the allurements of the female, was Mr. Herman Coppinger, surgeon and Dampier's companion on his first long voyage around the world. We first hear of him at the Island of Sal in the Cape Verdes, buying spurious ambergris.

> We stay'd here 3 days; in which time one of these Portuguese offered to some of our Men a lump of Ambergreece in exchange for some Cloaths, desiring them to keep it secret, for he said if the Governor should know it he should be hanged. At length one Mr. Coppinger bought it for a small matter; yet I believe he gave more than it was worth. We had not a Man in the Ship that knew Ambergreece; but I have since seen it in other places, and therefore am certain it was not right. It was of a dark colour, like Sheeps Dung, and very soft, but of no smell, and possibly 'twas some of their Goats Dung.[42]

Thus was Mr. Coppinger at the outset of his travels still trusting and gullible. I doubt whether he would have been so ready later to buy goat's dung for ambergris as he was at the time of his sojourn among the primitive gold-brick men of the Cape Verde Isles.

His next appearance is more exciting. The voyage seems to have come to a long halt at Mindanao. The Filipino ladies (Pagalies), offered by the hospitable inhabitants (for a consideration) to the crew, were too much for the ship's discipline. Dampier's captain, Swan, spent all of his time ashore. The crew was mostly drunk (those that had money); those that had none were quarrelsome and dissatisfied and wanted to go on. After seven months' delay a mutiny broke out. Captain Snow was ashore; the mutineers were aboard ready to sail.

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[40] Esquemeling. *Op. cit.*, p. 244.

[41] Esquemeling. *Op. cit.*, p. 245.

[42] Dampier, I, 101.

> Which would have been presently, if the Surgeon or his Mate had been aboard; but they were both ashore, and they thought it no Prudence to go to sea without a Surgeon: Therefore the next Morning they sent ashore one John Cookworthy, to hasten off either the Surgeon or his Mate, by pretending that one of the Men in the Night broke his Leg by falling into the Hold. The Surgeon told him that he intended to come aboard the next day with the Captain, and would not come before; but sent his Mate, Herman Coppinger.
>
> This Man sometime before this, was sleeping at his Pagallies and a Snake twisted himself about his Neck; but afterwards went away without hurting him. In this Country it is usual to have the Snakes come into the Houses and into the Ships too; for we had several came aboard our Ship when we lay in the River. But to proceed, Herman Coppinger provided to go aboard; and the next day, being the time appointed for Captain Swan and all his Men to meet aboard, I went aboard with him, neither of us distrusted what was designing by those aboard, till we came thither. Then we found it was only a trick to get the Surgeon off; for now, having obtained their Desires, the Canoa was sent ashore again immediately, to desire as many as they could meet to come aboard; but not to tell the Reason, lest Captain Swan should come to hear of it.
>
> So we left Captain Swan and about 36 Men ashore in the City, and 6 or 8 that run away; and about 16 we had buried there, the most of which died by Poison. The Natives are very expert at Poisoning, and do it upon small occasions: Nor did our Men want for giving Offence, through their general Rogueries, and sometimes by dallying too familiar with their Women, even before their Faces. Some of their Poisons are slow and lingering; for we had some now aboard who were Poison'd there; but died not till some Months after.[43]

Mr. Coppinger travelled widely about the East Indies: We hear of him in Manila, whence he throws us the prettiest bit of news about another impromptu confrére:

> Mr. Coppinger, our Surgeon, . . . made a voyage hither (to Manila) from Porto Nova, a Town on the Coast of Coromandel, in a Portuguese Ship, as I think. Here he found 10 or 12 of Captain Swan's Men; some of those that we left at Mindanao. For after he came from thence, they brought a Proe there, by the Instigation of an Irish Man, who went by the name of John Fitz-Gerald, a person that spoke Spanish very well; and so in this their Proe they came hither. They had been here but 18 months when Mr. Coppinger arrived here, and Mr. Fitz-Gerald had in this time gotten a Spanish Mustesa Woman to Wife, and a good Dowry with her. He then professed Physick and Surgery, and was highly esteemed among the Spaniards for his supposed knowledge in those Arts; for being always troubled with sore Shins while he was with us, he kept some Plaisters and Salves by him; and with these he set up upon his bare natural stock of knowledge, and his experience in Kibes. But then he had a very great stock of Confidence withal, to help out the other; and being an Irish Roman Catholick, and having the Spanish language, he had a great advantage of all his Consorts; and he alone lived well there of them all.[44]

A jolly, cunning rogue, Mr. Fitz-Gerald, with his Kibes, his Spanish Mustesa, his Dowry and his Salves and Plaisters, setting out his shingle in Manila 250 years in advance of his natural successors.

Mr. Coppinger and Dampier were much alike in their scientific tastes and their gravity. The companionship of the mutineers grew more and more irksome; their only thoughts were to get away; they were better scientists than pirates. In May of 1687 they were at Pulo Condore, an island off the coast of Cambodia.

> While we stayed here Herman Coppinger our Surgeon went ashore, intending to live here; but Captain Read sent some Men to fetch him again. I had the same Thoughts, and would have gone ashore too, but waited for a more convenient place. For neither he nor I, when we were last on board at Mindanao, had any

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[43] Dampier, 1, 376.

[44] Dampier, 1, 386–387.

> knowledge of the Plot that was laid to leave Captain Swan, and run away with the Ship; and being sufficiently weary of this mad Crew we were willing to give them the slip at any place from whence we might hope to get a passage to an English Factory.[45]

They tried to get away again at the Nicobar Islands. When the ship was ready to sail Dampier got up his chest and bedding and desired the Captain to leave him ashore. He did leave him, but soon sent four or five armed men after him to fetch him aboard again. When he came aboard:

> Found the Ship in an uproar. For there were 3 Men more, who taking Courage by my example, desired leave also to accompany me. One of them was the Surgeon, Mr. Coppinger. . . . But Capt. Read and his Crew would not part with the Surgeon. At last the Surgeon leapt into the Canoe, and taking up my Gun, swore he would go ashore, and that if any Man did oppose it, he would shoot him. But John Oliver, who was then Quarter Master, leapt into the Canoe, taking hold of him, took away the Gun, and with the help of two or three more, they dragged him again into the Ship.

They finally let Dampier and two others go, who later made their way to Sumatra, but the Surgeon they forced to stay.

> Now we were Men enough to defend our selves against the Natives of this Island, if they should prove our Enemies: though if none of these Men had come ashore to me, I should not have feared any danger. Nay, perhaps less, because I should have been cautious of giving any offence to the Natives: and I am of the Opinion, that there are no People in the World so barbarous as to kill a single Person that falls accidentally into their Hands, or comes to live among them; except they have before been injured, by some outrage, or violence committed against them. Yet even then, or afterwards, if a Man could but preserve his Life from their first rage, and come to treat with them (which is the hardest thing, because their way is usually to abscond, and rushing suddenly upon their Enemy to kill him at unawares) one might, by some slight, insinuate ones self into their Favours again.[46]

Mr. Coppinger did get away at last. The mutineers intended to sail to Persia, but being unable to weather Ceylon they sought refuge on the coast of Coromandel. Coppinger and another man left "this mad fickle crew" and went to the Danes at Trangambar (Tranquebar) who received them kindly. Here they lived very well. Coppinger engaged as surgeon on a Danish vessel, and sailed to Jihore on the Malacca coast to load pepper.

This is the last we hear of him. A quiet, serious-minded man, glad to get quit of the "mad fickle crew" with whom he had embarked.

There is not room to follow the fortunes of more of these rover surgeons, but we must consider some of the true pirates. They were a different breed; cut-throat, murdering rascals and knaves.

The exploits of the older English sea-rovers and buccaneers fire one with admiration; their ferocity and knaveries one condones. They were bred in a school of terror. It is difficult for us, nurslings of a soft age, to put ourselves in the old sailor-man's place; to picture the life and turn of mind and thought of these unlettered fighters, starving or subsisting for weeks together on rotten meat and rum, flogged with a rope's end at a tyrant captain's whim, sore and bloated with scurvy and syphilis, scabrous with lice and the itch. The natural recourse of such men's minds was drink, for that made merry men of poor tortured beasts. To see others suffer cannot have affected them much, for what did they not continually suffer themselves; to see others die (how often had not they seen their own shipmates die?) of wanton cruelty, starvation, hardships and disease. If they were fierce, their foe was fiercer; and if Henry Morgan put up the friars and nuns of Puerto Bello as a fence to his own pirates for the Spaniards to shoot at when he stormed the forts, the Grand Inquisitor of Seville dealt no more gently, although perhaps more pompously and formally, with such English seamen as fell into his hands. If the old sea-rovers and buccaneers were cruel and terrible to their foes, cruel and terrible were the hardships they themselves endured. Their war was legitimate war, and their foes legitimate foes (in their eyes at least); they endured and inflicted cruelties and terrors in pursuit of them.

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[45] Dampier, I, 399.

[46] Dampier, I, 470–471.

Not so with the pirates. With the exception of Captain Bartholomew Roberts (and Lafitte who was as much of a privateer and patriot as a pirate) there was scarcely a one who at the generous moment did not show himself a coward; their cruelties were those of maniacs and devils, hellish wantonnesses that one cannot find a place for among Englishmen. Theirs was the savagery of wolves, when the overpowering odds were on their side, or when they were brought to bay. From equal combat with men of their own race they turned tail and fled. Their cruelties were those of the Orient, or of the ancient Slavs and Vandals: tearing men's hearts out and roasting them alive, dragging out their testicles with a rope, cutting their ears and lips off and slashing open their bellies. One turns from them with abhorrence.

These sea-devils too had their doctors.

Among the worst of them was one Captain Ned Low. Low was bred a Westminster pickpocket, petty rogue and thief. He came to Boston and was married there in 1714. Soon after, his wife bore him a daughter and died in childbirth. Amid all his maniacal cruelties Low would never force a married man, and mention of his daughter would bring tears to his eyes. In 1722 he began his career of piracy and for two years terrorized the Atlantic from Newfoundland to the West Indies and eastward to the Azores. August, 1722, found him at the Azores, where he took seven vessels, among them a French ship. He transferred the crew to a launch, all except the cook, whom he declared to be a "greasy fellow who would fry well." He tied him to the mainmast and set fire to the ship. Soon after a Captain Carter in the "Wright" galley sailed by. Carter resisted capture, so Low cut and mangled the passengers most cruelly; two Catholic friars he triced up to the end of the mainyard until they were near dead, when he let them down, repeating this sport again and again. One of the pirates saw a Portuguese passenger looking on in terror: he disemboweled him with a cutlass because he "didn't like his looks." Low himself was struck on the chin by a blow intended for another passenger. The blow laid open his teeth. His surgeon was called to stitch it up, but Low found fault with the way the job was done. The surgeon therefore hit him on the jaw with his fist and tore the stitches out again: "Go to Hell and sew up your own chops," said the doctor.

Sailing back to Brazil, Low fell in with a Portuguese vessel whose unfortunate captain slung his treasure of 11,000 moidores out of the cabin window in a sack. When he saw that capture was inevitable, he cut the rope and dropped the treasure into the sea. Low heard of it: he tied the wretched man to the mast, slashed off his lips with a cutlass, broiled them, peppered them and made the mate of the captured vessel eat them hot.

He sailed from Brazil to some of the smaller isles off the Venezuelan coast where, through drunkenness or ignorance, he turned his vessel turtle while trying to careen her. He and his surgeon were in the cabin when the sea gushed in; they both bolted out of one of the ports together. Low got out but the doctor was carried under by the force of the waters "upon which Low nimbly run his Arm into the Port and caught hold of his Shoulder and drew him out, and so saved him," the account says. His vessel was lost.

Cruising about the French West Indies it came into his head that he wanted a doctor's chest, so he put four French captives aboard a prize sloop and sent them off to St. Thomas to tell the Governor that if he'd not sell him a good chest for the money his captives brought with them he'd kill all the Frenchmen and burn ten or more French vessels that he then had in his hands. His captives returned with the chest.

We have no clear account of Low's end. It is probable that his crew cast him adrift for murdering his quartermaster in his sleep and that he was taken and hanged by the French on the Isle of Martinique.

With Low there sailed Charles Harris. Harris was second mate of a captured vessel; he joined the pirates and Low gave him command of a prize, the sloop Ranger. On June 10, 1723, they were sighted between Cape Delaware and Block Island by the man-of-war Greyhound, Peter Solgard commander, of the New York station which had received advice of their being off the coast. Captain Solgard stood to the South and led them on by pretending to run away. Suddenly he turned and opened fire. The two pirates were more than a match for him, but Low fled while Captain Solgard engaged Harris in the Ranger. He took the Ranger and her crew and brought them into Boston, thirty-seven in all, where they were tried and hanged. Dow and Edmunds give an account of the trial. In the list of prisoners there is mentioned "John Hinchard, Doctor, age 22, Place of Birth, Near Edinburgh, N. Brit." This name, however, does not appear among the reports of the trials; here the doctor's name is John Kencate. Dow and Edmunds' report reads:

> The next morning John Kencate, the doctor on board the "Ranger" was brought to trial. The Advocate General stated that although the prisoner "used no arms, was not harness'd (as they term it) but was a forc'd man; yet if he received part of their plunder, was not under a constant durance, did at any time approve, or join'd in their villanies, his guilt is at least equal to the rest; the Doctor being ador'd among 'em as the pirates' God for in him they chiefly confide for their cure and life, and in this trust and dependence it is, that they enterprise these horrid depredations not to be heightened by aggravation, or lessened by any excuse."
>
> Capt. John Welland deposed, and that he saw the Doctor aboard the Ranger; he seem'd not to rejoice when he was taken but solitary, and he was inform'd on board he was a forc'd man; and that he never signed the articles as he heard of, and was now on board the deponants ship.
>
> John Ackin Mate and John Mudd Carpenter, swore they saw the prisoner at the Bar walking forwards and backwards disconsolately on board the Ranger.
>
> Archibald Fisher Physician and Chirurgion on board the said Greyhound Man-of-War deposed, that when the prisoner at the Bar was taken and brought aboard the King's ship he searched his medicaments, and the instruments, and found but very few medicaments, and the instruments very mean and bad.
>
> Others testified that the doctor was forced on board, by Low, and that he never signed articles so far as they knew or heard, but used to spend much of his time in reading, and was very courteous to the prisoners taken by Low and his company, and that he never shared with him.
>
> The Doctor himself said that he was chirurgion of the *Sycamore*—Galley, Andrew Scot, master, and was taken out of that ship in September last at Bonavista, one of the Cape de Verde Islands, by Low and Company, who detained him ever since, and that he never shared with them, nor signed their articles.
>
> The court then cleared the doctor . . .[47]

Of Peter Scudamore, Captain Bartholomew Roberts' surgeon, we have some detail. Roberts sailed from London in 1719 in an honest employ, as second mate of the ship Princess. His ship was taken by the pirate Howel Davis off the coast of Guinea the February following. Six weeks later, Howel Davis having been killed, Roberts was elected commander. He was a stern and bloody man, the prototype of the picture-book pirate. Coming into an engagement he was wont to array himself in a rich crimson damask waistcoat and breeches, and to hang a gold chain with a diamond cross about his neck. Two pairs of pistols hung at the end of a silken sling flung over his shoulders. Stern and bloody, as befitted his calling, he seems not to have committed the wanton atrocities of other pirate captains.

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[47] Dow and Edmunds. Pirates of the New England Coast. Salem, Mass., 1923, p. 302–303.

The year 1720 he spent in cruising about Brazil and Newfoundland and the West Indies. He narrowly escaped capture at the Barbadoes and the Isle of Martinique so that all Barbadoes and Martinican men were hated by him ever after. He had a flag made showing his figure, a flaming sword in hand, standing with a skull under each foot; the skulls were labelled A. B. H. and A. M. H., signifying A Barbadian's and A Martinican's Head. This flag he called the "Jolly Roger." In 1721 he sailed up and down the Guinea coast robbing and plundering and laying waste. The British man-of-war Swallow gave him chase and engaged him off Cape Lopez. They first drew on a smaller one of Roberts' ships, called the Ranger, and took her with her crew of sixteen Frenchmen, twenty Negroes, and seventy-seven English. While the Swallow was sending her boat to fetch off the prisoners, a great blast of smoke was seen pouring out of the Ranger's cabin. Half a dozen of the most desperate of the pirates, all hope of escape being gone, had fired their pistols into what was left of their powder. It was not enough to blow up the ship, but maimed and burnt them horribly. The Swallow's surgeon, seeing a pirate named Roger Ball distressingly burnt and sitting sullenly in a corner, asked him how he came to be so burnt and offered to dress his wounds for him. Ball swore that he should not and that if anything were applied to him he would tear it off. Nevertheless the surgeon dressed him, although with much trouble. At night Ball fell into a kind of delirium, probably a delirium tremens, and raved on the bravery of Roberts; so he was lashed down upon the forecastle. Resisting restraint, he was tied all the more severely, and his flesh being sore and tender with the powder burns he died the next day "of a mortification."

Four days later the Swallow engaged Roberts' own ship, the Royal Fortune. The crew who sighted the Swallow warned Roberts, but he was at breakfast with the captain of a recent prize and would take no heed. He fought very desperately until a grape-shot struck him directly on the throat and killed him.

> He settled himself on the tackles of a gun, which one Stephenson from the helm observing ran to his assistance and not perceiving him wounded, swore at him and bid him stand up and fight like a man; but when he found his mistake and that his captain was certainly dead, he gushed into tears and wished the next shot might be his lot. They presently threw him overboard, with his arms and ornaments on, according to the repeated requests he made in his lifetime.[48]

Roberts frankly owned that he had turned pirate to get rid of the disagreeable superiority of some of the masters he had been acquainted with and the love of novelty and change maritime peregrination had accustomed him to.

"In an honest service," said he, "there is thin commons, low wages, and hard labour; in this plenty and satiety, pleasure and ease, liberty and power; and who would not balance credits on this side when all the hazard that is run for it, at worst, is only a fore-look or two at choking." He is said never to have forced a man into piracy.

With Roberts' death the life and soul went out of his crew; they deserted their quarters and stood stupidly by; their mainmast was shot by the board and they surrendered and called for quarter.

On board the Royal Fortune were 157 men, whereof forty-five were negroes, and £2,000 in gold dust; only three men were killed in action.

Among the prisoners taken by the Swallow were three surgeons: Adam Comry, taken in the Ranger, joined from Ship Elizabeth, Capt. Sharp, January, 1722; Peter Scudamore, taken in the Royal Fortune, joined from Mercy galley at Calabar, October, 1721; and George Wilson, joined from Ship Tarlton of Liverpool, January, 1722.

The records of the trials stand as a monument to the fairness and despatch of English justice. They were held at the Factory of the Royal African Company at Cape Corso Castle (Cape Coast Castle). They were begun March 28, 1722; the first six pirates were hanged five days later without the gates of the castle and within the flood marks of the tide. The account stands: Acquitted seventy-four; hanged, thirty-two; respited, two; commuted to servitude, twenty; to the Marshalsea, seventeen; killed in the Ranger, ten; in the Fortune, three; died in the passage to Cape Corso, thirteen; died afterwards in the Castle, four; negroes seventy. Total 276.

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[48] Buccaneers and Marooners of America. Ed. and illus. by Howard Pyle. London, 1897, p. 328.

"The country wherein they happened to be tried," the narrative says, "is among other happinesses exempted from lawyers and law-books." A commission of five was therefore chosen, and any three commissioners were empowered to call to their assistance a number of qualified persons to make the court always consist of seven. The commissioners found some dfficulty in finding a proper indictment. Their oath ran "that they have no interest, directly or indirectly, in the ship or goods, for the robbery of which the party stands accused." As servants of the Royal African Company, however, they had an interest in the cargoes captured by the pirates. Furthermore it was impossible, particularly to specify in the charge as they were enjoined to do, "the circumstances of time, place, etc." for the various piracies. The indictment, therefore, was made on offering resistance to the King's Ship Swallow, and not for acts of piracy committed upon merchantmen.

The court considered whether or not they should pardon one Jo. Dennis who had early offered himself as King's evidence. They concluded no; although they lost by it "those great helps he could have afforded . . . because it looked like compounding with a man to swear falsely."

And finally . . . "to approve their clemency, it looking arbitrary on the lives of men to lump them to the gallows in such a summary way as must have been done had they solely adhered to the Swallow's charge, they resolved to come to particular trials."

> That the prisoners might not be ignorant whereon to answer, and so have all fair advantages to excuse and defend themselves, the court farther agreed with justice and equanimity to hear any evidence that could be brought to weaken or corroborate the three circumstances that complete a pirate: first, being a volunteer amongst them at the beginning; secondly, being a volunteer at the taking or robbing of any ship; or, lastly, voluntarily accepting a share in the booty of those that did; for by a parity of reason where these actions were of their own disposing, and yet committed by them it must be believed their hearts and hands joined together in what they acted against his Majesty's ship the Swallow.[49]

There is justice and fairness; in that court of commissioners, themselves but lately escaped with their lives from the hands of the men they had up before them for trial; sitting on a far African Coast, without fear of surveillance or check from the Mother Country, free to act as they would. Just and fair because they were Englishmen and wanted to be just and fair, and not because anyone or anything made them be so.

Of one of the surgeon-prisoners, Adam Comry, we have not many particulars; pictures of the two others, Scudamore and Wilson, we can construct in sufficient detail. Adam Comry was surgeon to the ship Elizabeth, Jo. Sharp master, taken by Roberts off the African coast in January, 1722. He was forced into the pirate service by Scudamore and served on board the Ranger. At the trial of the pirates he was acquitted. He seems to have been a kind and decent man, and to have been heartily uncomfortable in the company he was in. And well he might, with the ghost of a noose tickling at his neck.

George Wilson and Peter Scudamore were thorough rogues.

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[49] Trial. Quoted by Pyle, Buccaneers and Marooners of America, p. 335–336.

Wilson sailed as surgeon to the Ship Tarlton of Liverpool, Capt. John Tarlton master, which Roberts fell in with and captured near Cape Lahou off the Ivory Coast of Africa early in January, 1722. At this trial he testified that after he had been aboard the pirate vessel for a day or two, Captain Roberts told him "to his sorrow" that he was to stay there and ordered him to fetch his chest from the Tarlton:

> Which opportunity he took to make his escape; for the boat's crew happening to consist of five French and one Englishman, all as willing as himself, they agreed to push the boat on shore and trust themselves with the negroes of Cape Montzerado. Hazardous, not only in respect of the dangerous seas that run there, but the inhumanity of the natives, who sometimes take a liking to human carcasses. Here he remained five months, till Thomas Tarlton, brother to his captain, chanced to put into the road for trade, to whom he represented his hardships and starving condition; but was in an unchristian manner, both refused a release of this captivity, or so much as a small supply of biscuit and salt meat, because, as he said, he had been among the pirates. A little time after this the master of a French ship paid a ransom for him and took him off; but, by reason of a nasty leprous indisposition he had contracted by hard and bad living, was, to his great misfortune, set ashore at Sestos again.[50]

Other witnesses deposed (and judging by the joy he showed at being captured by the Pirates a second time their version seems the more likely), that the doctor did not "seize the opportunity to escape," but that his boat was swept ashore by a strong wind and that he was held there by the natives; and that it was this accident and not his intention that kept him from getting aboard the pirates again.

Captain Sharp of the Elizabeth met him at Sestos and "generously procured his release" buying him from his negro captors for a ransom of goods to the value of three pounds five shillings. Sharp took Wilson's note for the money; but the note did not much matter. As they left the ship after the capture by the pirates, Wilson asked the Captain whether the pirates had the note or no. And Sharp not being able to say, he replied, "It's no matter, Mr. Sharp, I believe I shall hardly ever come to England to pay it," which prophecy fell true, as we shall see later.

Captain Sharp testified at the trial that he thought he had done a charitable act in ransoming the Doctor till "meeting with one Captain Canning he was asked why he would release such a rogue as Wilson was? for that he had been a volunteer with the pirates out of John Tarlton."

Captain Sharp's ship Elizabeth was captured by Roberts a little later, so that Wilson fell into the pirates' hands a second time. Sharp and his surgeon Adam Comry must have rued the day they ransomed this doctor from the negroes. Three pounds five was much too good a price to have paid. Neither his legitimate master nor the pirates seem to have had a good word for him.

At the trial his colleague Comry testified:

> Although the prisoner had, on account of his indisposition and want, received many civilities from him before meeting with the pirates, he yet understood it was through his and Scudamore's means that he had been compelled among them. The prisoner was very alert and cheerful, he says, at meeting with Roberts, hailed him, told him he was glad to see him, and would come on board presently, borrowing of the deponent a clean shirt and drawers, for his better appearance and reception; he signed their Articles willingly, and used arguments with him to do the same, saying, they should make their voyage in eight months to Brazil, share six or seven hundred pounds a man, and then break up. Again, when the crew came to an election of a chief surgeon, and this deponent was set up with the others, Wilson told him, he hoped he would carry it from Scudamore, for that a quarter share (which they had more than others) would be worth looking after; but the deponent missed the preferment, by the good will of the Ranger's people, who, in general, voted for Scudamore, to get rid of him, the chief surgeon being always to remain with the commodore.

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[50] Pyle, p. 370–371.

It appeared likewise by the evidence of Captain Jo. Trahern, Tho. Castel, and others, who had been taken by the pirates, and thence had opportunities of observing the prisoner's conduct, that he seemed thoroughly satisfied with that way of life, and was particularly intimate with Roberts; they often scoffing at the mention of a man-of-war, and saying, if they should meet with any of the turnip-man's ships, they would blow up and go to h—l all together. Yet setting aside these silly freaks to recommend himself, his laziness had got him many enemies; even Roberts told him, on the complaint of a wounded man, whom he had refused to dress, that he was a double rogue to be there a second time, and threatened to cut his ears off.

The evidence further assured the court, from Captain Thomas Tarlton, that the prisoner was taken out of his brother's ship, some months before, a first time, and being forward to oblige his new company, had presently asked for the pirates' boat to fetch his medicine-chest away, when the wind and current proving too hard to contend with, he was drove on shore at Cape Montzerado.[51]

When he got aboard Roberts' ship the second time he found Thomas Tarlton, brother of his old captain John Tarlton, a fellow prisoner. He had met Thomas Tarlton at Cape Montzerado when he was cast ashore there among the natives and Tarlton had refused to ransom him. Here then was a chance for evening an old score. The doctor instigated the pirates against Tarlton, who was immediately, "in a most sad manner misused and beat, and had been shot, through the fury and rage of some of those fellows, if the town-side (i.e., Liverpool) men had not hid him in a staysail under the bowsprit, for Moody and Harper with their pistols cocked searched every corner of the ship to find him, and came to the deponent's hammock, whom they had like fatally to have mistaken for Tarlton, but on his calling out they found their error, and left him with this comfortable anodyne, that 'he was the honest fellow who brought the doctor.'"[52]

The doctor put up a lame and shifty defence at his trial. He said:

Ill-luck threw him a second time into the pirates' hands, in this ship Elizabeth, where he met Thomas Tarlton, and thoughtlessly used some reproaches of him for his severe treatment at Montzerado; but protests without design his words should have had so bad a consequence; for Roberts took upon him, as a dispenser of justice, the correction of Mr. Tarlton, beating him unmercifully; and, he hopes it will be believed, contrary to any intention of his it should so happen, because, as a stranger, he might be supposed to have no influence, and believes there were some other motives for it. He can not remember he expressed himself glad to see Roberts this second time, or that he dropped those expressions about Comry, as are sworn; but if immaturity of judgment had occasioned him to slip rash and inadvertent words, or that he had paid any undue compliments to Roberts, it was to ingratiate himself, as every prisoner did, for a more civil treatment, and in particular to procure his discharge, which he had been promised, and was afraid would have been revoked, if such a person as Comry did not remain there to supply his room; and of this, he said, all the gentlemen (meaning the pirates) could witness for him.

He urged also his youth in excuse for his rashness. The first time he had been with them (only a month in all), and that in no military employ; but in particular the service he had done in discovering the design the pirates had to rise in their passage on board the Swallow.[53]

And so the doctor was judged guilty.

His execution, however, was respited "till the King's pleasure be known," because the commander of the Swallow declared that Wilson had given him the first notice of a plot of the pirate prisoners to rise and seize the vessel while being conveyed from Wydah Road to Cape Coast Castle.

His sentence was never executed; he died abroad, and did never come again to England to pay his note to Captain Sharp.

A memory of roguery and laziness and knavery, you leave behind you, young Doctor Wilson. Your colleague Comry in the kindness of his heart fits you out with a clean shirt and drawers so that you may appear presentably before your pirate captain, you return his kindness by having him forced aboard against his will. You refuse to dress the wounded, and even your new pirate master tells you that you are a double rogue to be with him a second time and threatens to cut your ears off. All that saves your neck from the rope is betrayal of your fellow prisoners' plans for freedom.

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[51] Pyle. *Op. cit.*, p. 368–369.

[52] Pyle. *Op. cit.*, p. 367–368.

[53] Pyle. *Op. cit.*, p. 371–372.

Better for your reputation you had stayed among the negroes at Cape Montzerado and rotted there of your "nasty leprous indisposition."

The third of the doctor trio is Peter Scudamore, a blustering bragadoccio rascal, full of windy schemes, a Welshman; his last moments find him taking solace in religion; he sticks his neck into the hangman's noose chanting the thirty-first Psalm.

Here is the testimony at his trial:

PETER SCUDAMORE

Harry Glasby, Jo. Wingfield, and Nicholas Brattle, depose thus much as to his being a volunteer with the pirates from Captain Rolls at Calabar. First, that he quarreled with Moody (one of the heads of the gang), and fought with him because he opposed his going, asking Rolls in a leering manner whether he would not be so kind as to put him into the Gazette when he came home. And, at another time, when he was going from the pirate ship in his boat a tornado arose. "I wish," says he, "the rascal may be drowned, for he is a great rogue, and has endeavoured to do me all the ill offices he could among these gentlemen" (i.e., pirates).

And secondly, that he had signed the pirates' Articles with a great deal of alacrity, and gloried in having been the first surgeon that had done so (for before this it was their custom to change their surgeons when they desired it, after having served a time, and never obliged them to sign, but he was resolved to break through this for the good of those who were to follow), swearing immediately upon it, he was now, he hoped, as great a rogue as any of them.

Captain Jo. Trahern and George Fenn, his mate, deposed the prisoner to have taken out of the King Solomon their surgeon's capital instruments, some medicines and a backgammon table, which latter became the means of a quarrel between one Wincon and he, whose property they should be, and were yielded to the prisoner.

Jo. Sharp, master of the Elizabeth, heard the prisoner ask Roberts' leave to force Comry, his surgeon, from him, which was accordingly done, and with him carried also some of the ship's medicines; but what gave a fuller proof of the dishonesty of his principles was the treacherous design he had formed of running away with the prize in her passage to Cape Corso, though he had been treated with all humanity and very unlike a prisoner on account of his employ and better education, which had rendered him less to be suspected.

Mr. Child (acquitted) deposed that in their passage from the Island of St. Thomas in the Fortune prize, this prisoner was several times tempting him into measures of rising with the negroes, and killing the Swallow's people, showing him how easily the white men might be demolished, and a new company raised at Angola, and that part of the coast. "For," says he, "I understand how to navigate a ship, and can soon teach you to steer; and is it not better to do this than to go back to Cape Corso and be hanged and sun-dried?" To which the deponent replying he was not afraid of being hanged, Scudamore bid him be still, and no harm could come to him; but before the next day evening, which was the designed time of executing this project, this deponent discovered it to the officer, and assured him Scudamore had been talking all the preceding night to his negroes in Angolan language.

Isaac Burnet heard the prisoner ask James Harris, a pirate (left with the wounded in the prize), whether he was willing to come into the project of running away with the ship, and endeavour the raising of a new company, but turned the discourse to horse racing as the deponent crept nigher; he acquainted the officer with what he had heard, who kept the people under arms all night, their apprehensions of the negroes being groundless; for many of them having lived a long time in this piratical way, were, by the thin commons they were now reduced to, as ripe for mischief as any.

The prisoner in his defence said he was a forced man from Captain Rolls in October last, and if he had not shown such a concern as became him at the alteration he must remark the occasion to be the disagreement and enmity between them; but that both Roberts and Val. Ashplant threatened him into signing their Articles, and that he did it in terror.

The King Solomon and Elizabeth medicine-chests he owns he plundered by order of Hunter, the then chief surgeon, who, by the pirates' laws, always directs in this province, and Mr. Child (though acquitted) had, by the same orders, taken out a whole French medicine-chest, which he must be sensible for me as well as for himself we neither of us dared to have denied; it was their being the proper judges made so ungrateful an office imposed. If after this he was elected chief surgeon himself both Comry and Wilson were set up also and it might have been their chance to have carried it, and as much out of their power to have refused.

As to the attempt of rising and running away with the prize, he denies it altogether as untrue; a few foolish words, but only by way of supposition, that if the negroes should take it in their heads (considering the weakness and ill look-out that was kept), it would have been an easy matter in his opinion for them to have done it; but that he encouraged such a thing was false; his talking to them in the Angolan language was only a way of spending his time, and trying his skill to tell twenty, he being incapable of further talk. As to his understanding navigation, he had frequently acknowledged it to the deponent Child, and wonders he should now so circumstantiate this skill against him. Guilty.[54]

He seems for all his alacrity in signing their Articles, to have been in no great favour with the pirates themselves. When it came to elect a chief surgeon, the choice lying between Scudamore and Comry, the crew of the Ranger voted for Scudamore. By this means they hoped to get him off their vessel and onto the Royal Fortune, the flagship of the pirate fleet; the rule being that the chief surgeon was always to stay with the commodore. Diplomats and politicians, those pirates.

The "old standers" among the pirates walked to the gallows without "as much concern as a man would express at travelling a bad road; nay, Simpson at seeing among the crowd a woman that he knew, said, "He had lain with that bitch three times and now she was come to see him hanged."

But others behaved with seeming devotion and penitence, among them Doctor Peter.

Scudamore too lately discerned the folly and wickedness of the enterprise, that had chiefly brought him under sentence of death, from which, seeing there was no hopes of escaping, he petitioned for two or three days' reprieve, which was granted; and for that time applied himself incessantly to prayer and reading the Scriptures. He seemed to have a deep sense of his sins, of this in particular, and desired, at the gallows, they would have patience with him, to sing the first part of the thirty-first Psalm; which he did by himself throughout.[55]

> In thee, O *Lord*, do I put my trust; let me never be ashamed; deliver me in thy righteousness.
>
> Bow down thine ear to me; deliver me speedily; be thou my strong rock, for an house of defence to save me.
>
> For thou art my rock and my fortress; therefore for thy name's sake lead me, and guide me.
>
> Pull me out of the net that they have laid privily for me; for thou art my strength.
>
> Into thine hand I commit my spirit; thou hast redeemed me, O *Lord*, God of truth.
>
> I have hated them that trust lying vanities; but I trust in the LORD.

Thus sings the Doctor, the black cap over his head, his neck in the noose.

A trying time for the poor Welshman. Good-bye, Dr. Scudamore.

These few samples will do to sketch the sort of men who doctored the pirates and buccaneers. As men not so different from their present-day colleagues, all kinds: the grave, the blustering, the whimsical, the tranquil; the pompous, the cantankerous; the cock-sure, the lazy; the helpful, the kind; the roistering, the honest, and the knavish—all kinds but the picayune and the squeamish. Their surroundings may have fostered crime and sin, but no petty foibles; no paper rules and blanks to fill out, nor quarantines and surveys and public health regulations; only terrible foes, visible and invisible; terrible men, terrible disease, terrible tempests, heat, cold, hunger and thirst; terrible passion, greed, murder and savagery.

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[54] Pyle. *Op. cit.*, p. 363–366.

[55] Pyle. *Op cit.*, p. 382.

GALEN*

By ARCHIBALD MALLOCH, M.D., M.R.C.P. (LOND.)

MONTREAL, CANADA

IN the year 131 after the birth of Christ, at Pergamus amongst the wooded mountains of Asia Minor, a man was born who was to reign for fourteen hundred years in the realms of medicine. It was fitting that Claudius Galen's birthplace was hard by the Aesculapian temple where the priests had striven for so many years with what light they had to allay the sufferings of the diseased and afflicted. Pergamus was a place of the cultured and educated, and had once possessed a library which rivaled the famous one of Alexandria. In passing, it is worth mentioning that parchment is the modern form of *pergamena*, the preparation of which Eumenes of Pergamus improved about 180 B.C. This was necessary since Ptolemy Epiphanes had shown churlish rivalry and had checked the export of papyrus from Egypt in the hope of starving the library of Pergamus, the competitor of that in process of formation at Alexandria. Pergamus had already produced Apollodorus the rhetorician; later Oribasius (325–403), the great medical compiler, was born there.

Nicon, Galen's father, was an architect and, according to the tribute paid him by his son, was also an eminent mathematician and astronomer. Tradition has it that the choice of a profession for his son came to Nicon in a dream. In his fragment on dreams Sir Thomas Browne, the literary physician of Norwich, remarked: "We owe unto dreams that Galen was a physician, Dion an historian, and that the world hath seen some notable pieces of Cardan."

Galen studied in many different places, beginning in his native city. Following the ideal of Aristotle that "the physician should commence with philosophy" he became familiar with the works and ideas of Plato and Aristotle, of Zeno the Stoic, and of Epicurus, as his views of life, expressed in his writings, and as his subsequent work in logic bear out. At Smyrna he sat at the feet of Pelops the anatomist and physician and the peripatetic philosopher Albinus. In Corinth he studied also and in Alexandria under the anatomist Heraclianus. The latter place was then noted for its anatomy, as the law had lately given over the bodies of criminals for dissection. Like Dr. Askew, Galen was a great traveler in his youth and was filled with a burning zeal to add to his knowledge. He was interested in other branches of science and we hear of his visiting the asphalt beds beside the Dead Sea. This wide knowledge of many places and many persons stood him in good stead later on when he came to write.

At the age of twenty-seven Galen returned to his "father city." In his own country he was honored. He was made physician to the Aesculapian Temple and as one of the "Gymnastici" attended to the injuries which the youths received in the games. With the Greek ideal of "nothing too much" he found time for athletics himself and it is recorded that he gave directions on one occasion for the setting of his own arm. In one of his works on dietetics and hygiene ("De Sanitate Tuenda") he insists that gymnastics should be regulated by medical knowledge.

Like other mortals the physician is affected by his environment, and in the year 164, when political disturbances broke out in Pergamus, Galen left for Rome. Here in the foremost city of the world he resided for some years and became the most celebrated physician. As he himself has said:

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* My interest in Galen began in 1910 when Dr. F. J. Shepherd, then Professor of Anatomy at McGill University, according to his admirable custom, had some of his senior students read short papers upon the old anatomists. The essay written then has been revised and considerably added to. In its present form it was delivered as an address before the Ottawa Medico-Chirurgical Society, March 7, 1924.

"He cures most in whom most are confident," and Galen soon obtained a splendid reputation amongst the people of the upper classes and earned for himself the titles of *paradoxologus* and *paradoxopoeius* (the wonder-speaker and wonder-worker). He attracted the attention of such leading men as the Consul Boethus and the philosophers Eudemus and Alexander of Damascus, and these men suggested that he should deliver public lectures in anatomy, physiology and surgery. He told his audience that there could be seen two human skeletons at Alexandria and we can imagine that some of the young, enthusiastic students took the first ship sailing for that city. With our well-equipped laboratories and abundance of material for dissection it is hard for us to realize the great disadvantages under which the medical student of ancient times labored. For him animals alone were available for dissection.

But, alas, there were among Galen's fellow practitioners men with ideals far different from his own, charlatans who were jealous of his success, and these practically drove him from their midst after he had been in Rome for only about four years. His enemies taunted him with being a grammarian, a reasoner, a mere theorist, and not a practical physician, and, as a final and overwhelming objection, accused him of being a magician. Galen, however, was a man of resource and was never wanting for occupation, so he returned to Pergamus, went to study the metals of Cyprus and again visited Palestine to investigate the medicinal herbs. The emperor Marcus Aurelius, then at war in the north, recalled Galen and when he set out for the Danube made him physician to his son, Commodus, his successor. Galen with some pride tells us how he cured Marcus Aurelius of a "digestive disorder" diagnosed by other physicians as a fever. Galen records with no false modesty the remark of the Emperor to his son's tutor, Pitholaus: "We have only one doctor and that an honest one," and also tells us that the Emperor described him "as the first of physicians and the only philosopher, for the Emperor had tried many before who were not only lovers of money, but also contentious, ambitious, envious, and malignant." It has been said that Marcus Aurelius commissioned Galen to prepare for him the celebrated compound medicine, theriaca, of which the Emperor was accustomed to take a small quantity daily. For fifteen centuries much time was expended and much ink wasted in writing treatises on this compound which finally came to contain seventy or more drugs.

Galen returned once more to Pergamus and visited the island of Lemnos to learn the preparation of the popular medicine terra Lemnia (terra sigillata, clay made into lozenges with goat's blood; often stamped or sealed with the figure of a goat). It was also termed bolus rubra. Whether he ever went back to Rome or not is uncertain and the date of his death is variously stated between 200 and 210. His Arabian biographer, Abu'l-Faraj, states that he died in Sicily.

After the age of Pericles and the death of Hippocrates, the "old sage of Cos," the art of medicine had fallen from its high estate. For 500 years after Hippocrates died the field of medicine was occupied by quibbling discussion over minor points in the teaching of the great master. As has been the case over and over again in other branches of learning, so here the great truths of the leader were lost and his patient scientific methods, truly wonderful at his time, remained quite uncultivated. The Rationalists and Dogmatists contended with the Empirics and Methodists, and the Pneumatics with the Eclectics. Erasistratus and Herophilus of Alexandria, however, were great human anatomists; unfortunately only fragments of their writings are now extant.

Galen was born amidst this chaos. At recurring periods in the history of science the need of a great transcriber and encylopedist arises, one who can, as if on a threshing floor, separate the wheat from the chaff, choosing what is worth while from amongst the current opinions and writings that have come down to him. In brief, such was Galen's work, although we must be ready to admit that he also made real contributions of his own to medical knowledge by means of observation and experiment. This Pergamene stands in contrast with Hippocrates, and although his methods were different, he is said to have reverenced the latter's writings "as the voice of Deity." The Coan doctor was eminently practical, and we owe to him the first clearly written clinical histories and descriptions of disease based on the observation of definite cases. To Hippocrates medicine came first and not philosophy. Galen, on the other hand, sought to reunite the two. Macmichael, the author of "The Gold-Headed Cane," tells us that Boerhaave of Leyden has been compared with Galen, "being endowed with the same extensive range of knowledge on all topics, directly or indirectly connected with medicine, the same dexterity in availing himself of the information of his predecessors or contemporaries, and the same felicity in moulding these separate materials into one consistent and harmonious whole." Galen's great aim was to unite conflicting sects and divergent streams of doctrine in medicine, and to prove a synthesis which should combine his own results with those of his predecessors. He succeeded so far that in him Greek medicine reached its highest point. Important as was Galen's work he sometimes juggled his facts to support his theories, or at least did not always come to his facts with an open mind. The Arabians, and chief among them Avicenna, became more Galenic than Galen and not for centuries did physicians return to the simple and yet difficult method of Hippocrates, that of observation at the bedside.

Galen was a prolific writer and it is estimated that he must have left behind him upwards of 500 treatises, many of which have now been lost, several being burnt in the Temple of Peace and in his own house at Rome, although we know of their titles through Galen's references to them. Choulant gives 181 titles of which 98 are genuine, 19 are fragmentary, 45 spurious, and 19 doubtful. Even in Galen's lifetime writings were attributed to him which did not really come from his pen. It is amusing even at this date to hear what he says of one of these books which he himself discovered in a shop[1]:

> You are right, my good Bassus, in saying that I should write a little book on my own books, for in the Shoemakers' street in Rome, where there are many shops with books offered for sale, I came across some friends disputing as to whether a certain book was by me or by somebody else. Indeed it was plainly inscribed "Galenus medicus." When one of them wanted to buy it as being mine, a man well up in his reading was struck by the strangeness of the title and wanted to look further into it; he had scarcely read two lines when he put down the book exclaiming "This is not in Galen's style, the book is inscribed with a false title."

To the Arabians must be given the credit of preserving and handing down in Arabic translations a large body of Galen's writings. There was no Latin translation in classical times and even in the eleventh century Constantinus Africanus said none existed. Later the Arabic versions were rendered into Latin. Galen's successors were the Greek physicians of the Byzantine school who did little else than copy and comment upon his works. The first and most famous Greek edition was printed by Aldus at Venice in 1525, five volumes in folio. Linacre, the physician and classical scholar, one of the founders in 1518 of the Royal College of Physicians of London, translated a goodly number of Galen's works from the Greek directly into Latin. The best modern edition of Galen's medical writings with both Greek and Latin text was edited by C. G. Kühn and published at Leipsic

[1] Galen. De Libris Propriis. Ed. by Kühn, XIX, 8.

(1821–1833) in about twenty volumes. To those who are interested the writer would like to recommend the English translation by Dr. John Pocock of Edinburgh of Galen's book, "On the Natural Faculties," published in the Loeb Classical Library series in 1916. For the lucky few who read Greek, the text is also given. Not all of Galen's writings were medical, for philosophy, logic, mathematics, grammar and law also claimed his attention. There were some thirty treatises on logic alone, of which only two survive, and one of his lost works was upon scientific proof. Galen is said to have invented the fourth figure of the syllogism.

The late Dr. W. A. Greenhill, the medical historian, has divided Galen's medical works into seven classes:

(1) *Anatomy and Physiology*, especially the "De Usu Partium" in seventeen books. Here Galen tries to interpret the function of the different organs and their structures. His views are obtained chiefly from dissections of the ape, pig and dog, and this book constitutes a monument of careful observation. His physiology is not distinct from his anatomy. Our words "humor" and "temper" we derive from Galen's physiological views expressed in his writings. Galen was the founder of experimental physiology and in one of his treatises speaks of the long and arduous way of experiment which alone leads to truth, while the short and easy way of mere assertion fails to attain it.

(2) *On Dietetics and Hygiene.*

(3) *Pathology or the Science of Disease*, which is found interwoven in all of Galen's writings though there are some special works devoted to this subject, such as "De Temperamentis," "De Difficultate Respirationis," "De Plenitudine" (on plethora) and "De Tumoribus praeter Naturam" (morbid tumors, etc.).

(4) *On Diagnosis.* The ancients had to study symptoms extremely minutely in order to make a diagnosis. Galen's most famous work on diagnosis, which was written in his old age and perhaps contains his most important writings, is "De Locis Affectis." In this, various organs are taken up seriatim and Galen shows by what signs and symptoms their morbid conditions may be detected. His views as expressed in this book, rather than in any other of his works, fit in better with those of our time. Galen attempted to analyze many varieties of the pulse and wrote six treatises on this question.

(5) *Works on Pharmacy and Materia Medica.* Authorities are agreed that these writings attributed to Galen are largely in the nature of compilations and that nine of the sixteen works are spurious. The medicaments are classified according to their possession of the four elementary qualities of heat, cold, moisture and dryness. For what were termed hot diseases cold remedies were indicated. The term "cooling medicine" is a survival from Galen's time, and occasionally one hears of the galenicals, i.e., herbs or vegetable drugs, as opposed to the minerals.

(6) *Therapeutics, including Surgery.* The most important of these works is his "Methodus Medendi," which Linacre translated in 1519. Galen's aim was to systematize treatment and he compared himself to the Emperor Trajan who improved the roads throughout Italy. Galen succeeded so far that he was the dictator of the medical world for centuries. His smaller "Ars Parva" was known during the Middle Ages, through a version made from the Arabic, as "Microtechni," "Microtegni" or "Liber Tegni." It dealt with general principles rather than with details, and was the indispensable manual of the medieval physician. In early life Galen wrote on surgery but later left that side of medicine to the surgeons in Rome.

(7) *Commentaries on Hippocrates.* Galen wrote many such, one work consisting of seven books devoted solely to the "Aphorisms." For the student of Hippocrates Galen's commentaries are valuable in establishing the text and elucidating the subject matter.

Galen took a rational view of the treatment of disease except in his use of drugs, which was very crude and imperfect. These were classified according to the states induced by them: heat, cold, wetness and dryness. He retained the doctrine of the four humors of Hippocrates, blood, phlegm, and black and yellow bile, and the doctrine of "critical days" or *dies Aegyptici.* Michael Servetus writes that Galen believed that these were influenced by different phases of the moon. He recognized that health and disease are relative terms, that individual cases differ, and that to treat a patient intelligently we should know his state when in health. In the matter of diet he tells us to "look from the very first day to two things Hippocrates bids us consider in ordering a diet, viz., the greatest possible intensity of the disease, and the strength of the patient." By prolonged starvation "you may kill your man and the disease together."

It is amusing and instructing to see exactly how Galen relates his experiences and records his cases and at the same time tells us what he thought of his own skill and tact. The following passage[2] by John Watson is a translation from Kühn's edition[3]:

> Soon after my arrival in Rome, Glauco the Philosopher took a great fancy to me, in consequence of my reputed skill in diagnosis. Meeting me accidentally in the street and shaking hands with me, he remarked, "I have fallen upon you opportunely. I wish you to visit with me a patient in this neighbourhood whom I have this moment left—the Sicilian physician whom you saw walking with me some days since, and who is now ill." I inquired of him what ailed his friend; when with his habitual candour he replied, that Gorgias and Apelas had spoken to him of my skill in diagnosis and prognosis, which appeared to them more like the result of divine inspiration than of medical science; and that he wished to know for himself whether I really was thus skilful. He had hardly done speaking before we reached the door; so that I had no opportunity of replying [nor could I tell him—what you have often heard me say—] that on some occasions the signs of disease are certain, at other times they are ambiguous, and require to be considered again and again. But, as we entered, I observed a servant carrying from the sick chamber a vessel containing a thin bloody sanies, like the recent washing of flesh, a sure evidence of diseased liver. Without appearing to notice this circumstance, I proceeded with Glauco to the patient's apartment, when placing my fingers on the wrist of the sick man, I examined his pulse in order to determine whether the attack was inflammatory, or simply a weakness of the affected viscus. As the patient was himself a physician, he remarked that he had recently been up, and that the effort of rising might have accelerated the pulse; but I had already discovered the evidences of inflammation; and seeing on a recess in the window a jar containing something like a preparation of hyssop in honey and water, I knew that he had mistaken his disease for pleurisy; in which, as in inflammations of the liver, there is usually pain under the false ribs. He had been led to this opinion, as I at once perceived, by experiencing this pain, by his short and hurried breathing, and by a slight cough. Understanding the case, therefore, and turning to good account what fortune had thrown in my way, in order to give Glauco a high opinion of my ability, I placed my hands over the false ribs, on the right side of the patient, and at the same time declared this to be the seat of the pain, which the sick man admitted to be correct. Glauco, supposing that I had made this discovery merely by examining the pulse, began to express surprise. But to his intense astonishment, I added: "inasmuch as you admit the existence of pain at this spot, I wish you further to say whether you are troubled with a slight cough, and whether your cough is not dry, without sputa, and occurring at long intervals?" While I was yet speaking, the sick man was seized with a cough such as I had described; whereat Glauco was exceedingly excited, and no longer able to contain himself, began to vociferate in praise of my abilities. "Do not think," said I, "that these are all the discoveries my art enables me to make; there are others yet to be mentioned, which will elicit the testimony even of the patient." Then turning to the latter, I resumed: "Is not the

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[2] Watson, J. The Medical Profession in Ancient Times. N. Y., 1856, pp. 153–156.

[3] Galen. *Op. cit.*, VIII, 361.

pain in this part increased, and accompanied with a sense of weight in the right hypochrondrium, whenever you take a full breath?" At hearing this the patient also was surprised, and was as loud in my praise as Glauco. Seeing fortune still smiling upon me, I was desirous of making some remarks in reference to the shoulder, which appeared to be drawn downwards, as often occurs in severe inflammations as well as induration of the liver; but I did not venture to speak on this point, fearing to diminish the admiration which I had already excited. Nevertheless I touched upon it cautiously, saying to the patient, "You will [soon] feel the shoulder drawn downwards, if perchance you do not find it so already." When he admitted this symptom also, seeing him greatly astonished, I said, "I will add but one other word to show what you conceive to be the nature of your complaint." Glauco declared he would not be surprised if I should do even this. But the patient, overcome with wonder at such a promise, observed me closely, waiting for what I should say. I told him he had taken his disease to be a pleurisy. This, with a further expression of surprise, he admitted to have been his opinion, as well as that of his attendant who had been fomenting his side with oil for the relief of that disease. From this time forward Glauco entertained the highest opinion both of me and of our art; for, having never before come in contact with a physician of consummate ability, he had hitherto formed but an humble estimate of the profession. I have related to you these particulars, Galen adds, as if addressing a class of medical students, in order that you may understand that there are symptoms peculiar to particular diseases, and others common to several diseases; and further, that there are some symptoms inseparable from the disease, some usually accompanying it, others again of uncertain character or of rare occurrence; so that if fortune offers at any time to you a good opportunity, as in the instance just related, you may know how to take advantage of it; remembering that fortune often presents to us the means of acquiring fame, which, through ignorance many are unable to turn to good account.

Fisher,[4] quoting this, adds the comment:

> Excusing the conceit of our author, it is extremely interesting to listen to his fluent sentences which have come down through the long lapse of ages, as fresh and familiar as if spoken but yesterday. The methods of acquiring fame which he has here taught continue in use, and prove very serviceable to not a few of the modern disciples of Galen.

Galen's most important work was done in aid of the sciences of physiology and anatomy, but it must be borne in mind that practically all his dissections were of monkeys and other animals and not of man. In physiology he was the first great experimenter. By ligating an artery in two places and incising it he was able to prove that the blood-vessels contained nothing but blood. This discovery was in direct opposition to the theory of his own time although Aristotle had said that they contained blood. It was thought by Galen's contemporaries that the arteries carried "vital air" which rushed out on first cutting into them, and then the blood was transfused from distant parts. In his work "De Locis Affectis" he calls attention to the value that lies in a knowledge of normal physiology, for by recognizing physiological disturbances the site and nature of a disease may be determined.

Galen's conception of the nature and purpose of the circulatory system seems strange indeed to us although his ideas mark a distinct advance beyond those of his forerunners. According to him the liver is the center of the venous system where the chyme, or the food gathered up from the stomach and intestines by the portal system, is endowed with *natural spirits* and converted into the cruder form of blood for the nutrition of various parts of the body. The blood ebbs and flows in the inferior vena cava to nourish the lower half of the trunk and the lower limbs. Blood also ebbs and flows to and from the liver by way of the superior vena cava to the head and upper limbs and upper part of the body. Part however flows to the right side of the heart where by the innate heat of that organ it is partially purified. A small portion of the blood that reaches the right side of the heart goes by the pulmonary artery to the lungs for their nourishment and there "the fumes or sooty excreta" of the blood are removed by expiration. The rest of the blood that gains entrance into the right side of the heart passes through the septum by minute invisible pores into the left ventricle. Galen says we must assume the existence of these fine openings. In the left ventricle air drawn from the lungs during the diastole of the heart (like a suction pump) mixes with the blood and, in the presence of the innate heat of the heart, *vital spirits* are formed. This air also prevents the innate heat from becoming too great. The blood ebbs and flows in the arteries as it does in the veins to all parts of the body and the *vital spirits* make possible the functions of the various organs. *Animal spirits* are generated when the *vital spirits* reach the brain and are carried out along the nerves to bring about movements and sensation and subserve the highest functions of the body.

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[4] Fisher, G. J. *Ann. Anat. & Surg.*, Brooklyn, 1881, IV, 165–168.

Galen described the foramen ovale and the ductus arteriosus (the channel connecting the pulmonary artery and aorta in fetal life) but knowledge of the former was lost, and when Leonardo Bottallo described it in the adult in the sixteenth century, it was hailed as a great discovery. This is an instance of the many discoveries that have been remade in the science of medicine, a fact which led Francis Bacon shrewdly to observe that "its labour has been more in a circle than a progression."

Galen insisted that there are fine anastomoses between the arteries and veins throughout the whole body and he said that a small amount of blood from the right ventricle reached the pulmonary veins and thence the left side of the heart. Osler has said: "He narrowly missed discovering the general circulation of the blood." Harvey in his turn, when he discovered the circulation in the seventeenth century, had to assume that the finest arteries communicated with the smallest veins. In 1661 Malpighi with the microscope *saw* this anastomosis in the capillaries. Despite the fact that for Galen diastole and not systole or contraction of the heart was the important phase, one has only to read Harvey's book, "De Motu Cordis," to see the foundation which Galen had laid for the discovery of the circulation. It never ceased to be a wonder to Harvey that Galen, *divinus ille vir* as he called him, had not seen the natural deductions from his own observations.

Payne in his Harveian Oration in 1896, entitled "Harvey and Galen" says: "It is not till we come to the days of Sir Charles Bell and Magendie that we find anyone comparable to Galen as a nerve physiologist." He distinguished between motor and sensory nerves; the former, he said, controlled the muscles "as chariot horses are managed by reins." He described seven pairs of cranial nerves. Abdominal and thoracic breathing were both known to him and he described with accuracy the effects on respiration of cross-section of the spinal cord at different levels. He tried the effects of longitudinal section also. He recognized both motor and sensory paralysis and showed that sensation was therefore not a mere passive phenomenon. Division of the recurrent laryngeal nerve produced loss of voice, he said, and thus showed that the voice did not come from the heart as was the current view. According to Kussmaul, Galen observed that word memory may be lost through disease or cranial injury.

The similarity of the pleura and peritoneum was clear to Galen and he gave an adequate description of the latter membrane and of the great omentum. He described the several divisions of the alimentary canal and pointed out that by its many convolutions the intestine presents a more extensive surface for absorption. He observed the great vascularity of the kidneys and concluded from this fact that the urine must necessarily be excreted from the blood. Galen's description of the organs of generation is brief and in this case he was influenced by physiological dogmas. He was the first to declare, however, that the child did not exhibit active movements at birth which aided parturition but that it was expelled by uterine contraction. This idea was lost for centuries.

In the anatomy of the bones Galen classified those of the cranium and described the sutures. He distinguished the three parts of the temporal bone, the different divisions of the spinal column, the bones of the thorax, the extremities and the articulations. His descriptions of the grosser muscles are still largely adhered to. He described six muscles of the eye, but, as on other occasions, his description applies more accurately to the eye of a quadruped. Galen distinguished the difference in action of the temporal and masseter muscles. He compared the glottis with the mouthpiece or tongue of a reed-pipe, though he declares the comparison would be more apt if put the other way as "the glottis is the work of Nature, while the reed-pipe is a production of Art."

Though now remembered by name in the textbooks in connection only with his veins at the base of the brain, he stood as the final authority in matters medical until Vesalius, in his "De Fabrica Humani Corporis,"[5] showed clearly into what errors Galen and Galenism had fallen. Even then, as the late Professor Macleod of Glasgow put it in an address, "The Four Apostles of Surgery": "Men preferred to err with Galen than be corrected by Vesalius."

Galen was a monotheist and a teleologist like Paley, who saw design in all things of the universe. Listen to what he says in his "De Usu Partium":

> In writing these books, I compose a true and real hymn to that awful Being who made us all; and, in my opinion, true religion consists not so much in costly sacrifices and fragrant perfumes offered upon His altars, as in a thorough conviction impressed upon our minds, and an endeavor to produce a similar impression upon the minds of others, of His unerring wisdom, His resistless power, and His all-diffusing goodness. For His having arranged everything in that order and disposition which are best calculated for its preservation and continuation, and His having condescended to distribute His favours to all His works, is a manifest proof of all His goodness, which calls loudly for our hymns and praises. His having found the means necessary for the establishment and preservation of this beautiful order and disposition is as incontestable a proof of His wisdom as His having done whatever He pleased of His Omnipotence.

Galen was not, however, a member of "the church at Pergamus." Dante places him in the first circle of the Inferno among those who lived without baptism or Christianity, but in such a profitable company as that composed of Socrates, Plato, Dioscorides, Euclid, Ptolemy, Aristotle (*il maestro di color che sanno*—the master of those who know), Hippocrates, and the Arabian physicians, Avicenna and Averrhoes.

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[5] Basel, 1543.

STUDIES IN PALEOPATHOLOGY

[Second Series, I]

A PREHISTORIC SURGICAL BANDAGE FROM PERU*

By ROY L. MOODIE, PH.D.

CHICAGO, ILLINOIS

A NUMBER of primitive appliances for the relief of distress due to disease or injury has been discussed by various authors, and I have listed many of the writings on this subject and have discussed some of the evidence in my recent volume.[1] It will suffice here to recall the interesting splints described by G. Elliot Smith from ancient Egypt,[2] and the rawhide splints, bark corset and other primitive and possibly ancient surgical appliances described by Freeman[3] as being used by the North American Indians. Other primitive methods for more recent people have been discussed by Hilton Simpson in Kabylia[4] and Bandelier in Bolivia.[5] The subject of prehistoric surgery has not been exhaustively studied.

Recently while working under the auspices of a Sigma Xi Fellowship I studied at San Diego an example of the oldest, and so far as I know the only, prehistoric surgical bandage known from the Western Hemisphere. The specimen is so well preserved and the bandage so unique that it is well worth separate discussion.

The specimen[6] is in the San Diego Museum of Anthropology, in Room IV, in which are assembled a large and varied assortment of prehistoric and some recent evidences of bone pathology. The collection was made by Dr. Ales Hrdlicka and was assembled largely from prehistoric cemeteries in Peru. A number of more recent examples of diseases of the skeleton are, however, introduced for comparison and represented by skeletal material from the Eskimos of St. Lawrence Island, in Bering Sea. This assemblage is one of the most striking collections of objects relating to ancient human disease of which I know. It was gathered primarily for display at the Panama-California Exposition of 1915 and has remained as a permanent exhibit under the directorship of Dr. Edgar L. Hewett.

The most favorable region in the Western Hemisphere in which we might hope to find information of the morbidity and causes of death among the prehistoric inhabitants is Peru. Here, especially along the coast region, up to recent times, a great many of the prehistoric Indian cemeteries have been excavated by the immediate residents of the vicinities and others in order to obtain the pottery, ornaments and other objects of value usually placed in the graves by the early inhabitants of Peru. As a rule the skeletons found in the graves were left scattered in and on the sands, to be gradually disintegrated by the weather. Many hundreds of such despoiled cemeteries exist along the Peruvian coast, and the excellent collection now contained in the San Diego Museum was gathered here in 1913 by Dr. Ales Hrdlicka.[7] The one great disadvantage in such a collection is, of course, that it is difficult, if not impossible, to associate the scattered skeletal elements with any reasonable degree of accuracy. All of the interesting specimens that were still in fair condition of preservation were secured, and now form a unique exhibit of prehistoric American pathology. Many of the skeletal elements have suffered some checking of the outer table due to exposure to the weather. This has obscured somewhat the details of the surface lesions in a few cases, but on the whole the material is in a first class condition. I hope to report fully on the entire collection, bringing out by drawings and photographs many of the more interesting pathological and surgical facts.

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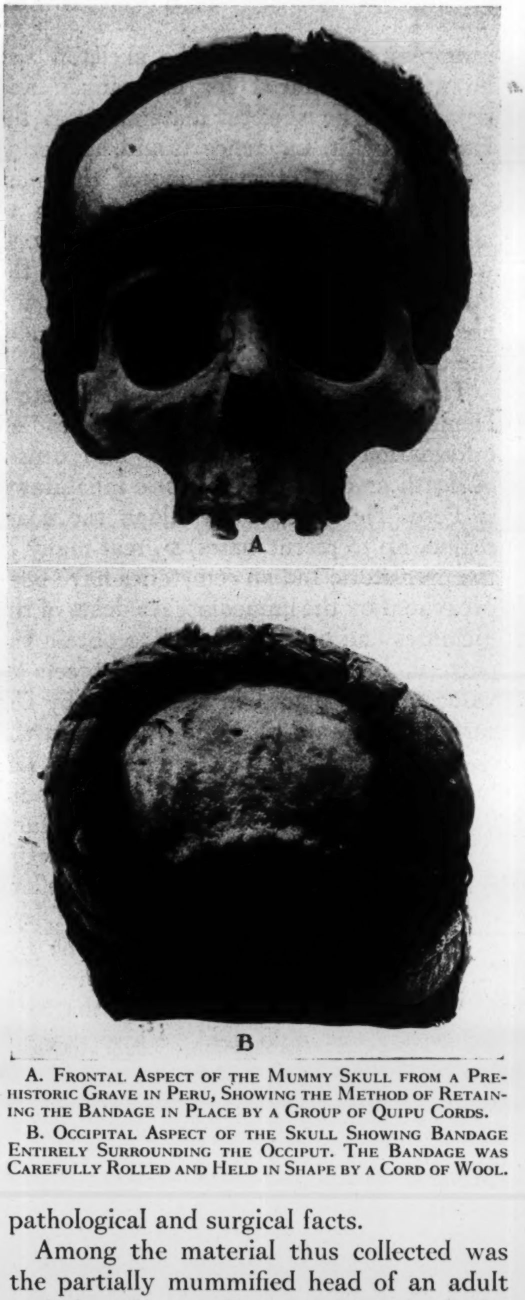
* The present contribution is the first of a series begun in Southern California under the auspices of a Sigma Xi Fellowship and continued under grants from the Graduate School of the University of Illinois and the American Association for the Advancement of Science. The series will consist of brief contributions on special topics which arise in conjunction with the larger projects of the study of phases of Paleopathology. Each study will be complete in itself and will carry its own illustrations.



A. Frontal Aspect of the Mummy Skull from a Prehistoric Grave in Peru, Showing the Method of Retaining the Bandage in Place by a Group of Quipu Cords.

B. Occipital Aspect of the Skull Showing Bandage Entirely Surrounding the Occiput. The Bandage was Carefully Rolled and Held in Shape by a Cord of Wool.

Among the material thus collected was the partially mummified head of an adult male from Lomas, Peru, a coast town in the southern part of the country. The skull bears the catalogue number 658. The exposed bones are perfectly preserved, being quite white and firm. Around the occiput of this head was found the oldest surgical bandage in the Western Hemisphere. An antiquity of 1500 years has been assigned to it, but in view of our defective knowledge of ancient Peruvian chronology, some modification of this view may be made. It is doubtless very ancient, and certainly represents a period long prior to that of the Spanish occupation.

As may be seen in the photographs (A, B) the bandage itself consists of a roll of finely woven white cotton cloth, the roll being approximately an inch thick. The bandage was held in place by several strands of strong, finely twisted woolen cord. This cord is now a very dark brown and in some places quite black. It was doubtless made of the wool of some one of the species of camel[8] used by the ancient Peruvians as a domestic animal, beast of burden, and a source of food and clothing.

The ancient inhabitants of Peru under the rule of the Incas were very proficient in the manufacture of this cord which was used in their Quipu or knot record.[9] The primitive surgeon adapted this method of supporting his bandage since the cord was doubtless commonly used in ancient households for many purposes. The cord is perfectly preserved and retains its texture remarkably well in view of its age. The body must have lain in the dry sand of the coast region, well protected from the elements.

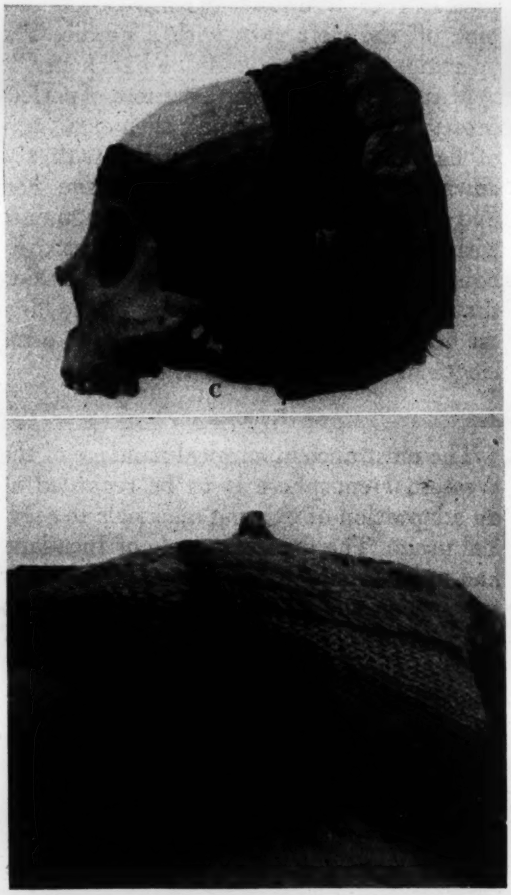
There were two species or varieties of cotton employed by the prehistoric Peruvians[10] in the manufacture of cloth, a reddish brown and a white. The bandage roll encircling the occiput appears to have been woven from the white cotton of a very pure color. It is only slightly stained, being otherwise perfectly clean after all the centuries it has lain in the sand. The cloth is finely woven with a fairly small mesh. It has the appearance of being a good absorbent and compares favorably with modern surgical gauze.[11] In this case again the cloth was doubtless an adaptation, since we do not suppose that a special kind of cloth was woven for surgical purposes.

The lesion which this bandage was intended to protect is said to be under the bandage on the left parietal. It was, doubtless, a deeply penetrating wound from a pointed object. Whatever it was there was not much loss of blood since the roll of cloth is only slightly stained. F. Wood Jones has shown that in ancient Egyptians blood stains persist for many centuries. The specimen is entirely too valuable in its present condition to risk disturbing the ancient arrangement of the cords to determine the nature of the lesion. Part of the scalp and some of the hair are still retained under the bandage and cords.

It is well and widely known that the ancient Peruvians had quite extended surgical practices, such as trephining, amputations and excisions, and we are able now to add bandaging to the list of their accomplishments. Their surgical lore, with a photograph of prehistoric surgical instruments now contained in the United States National Museum are given in Chapter xv of my recent volume.[12]

I have devoted several weeks to a study of the head lesions, especially, as shown in the San Diego Museum collection, in an attempt to discover if their surgical practices could be regarded as rational processes for the relief of definite skull lesions, rather than as largely superstitious procedures for the relief of demon-seizure or as a form of religious practice. My study is not yet complete but this ancient surgical bandage appeared to me so interesting that I take this opportunity of placing before those interested in medical history a brief account and illustrations of one of the most ancient and primitive surgical appliances known in the Western Hemisphere.

It need not be surprising that such a frail material as this gauze has been preserved in the hot dry sand for centuries if we realize that parts of the intermittent desert which extends along the Western coast of South America for about two thousand miles are extremely hot and dry. In some districts the climate is the most arid of any region in the world, there being no rainfall for periods of fifty or one hundred years.[13] In the desert of Atacama, in Chile, wood of the tree, algarrobo, after being buried in the sand for hundreds of years is extensively quarried for fire wood. These ancient people were the finest weavers of all time, and often their fabrics, finished and unfinished, were buried with the artist. Crawford[14]



C. LEFT LATERAL ASPECT OF SKULL OF MUMMY SHOWING OTHER PRIMITIVE ARRANGEMENTS FOR HOLDING THE BANDAGE, WHICH IS THE HEAVY ROLL OF CLOTH, IN PLACE. THE INJURY, FOR WHICH THE BANDAGE WAS APPLIED, IS INDICATED BY THE ARROW AS BEING PRESENT ON THE LEFT PERIETAL SOME DISTANCE FROM THE SAGITTAL SUTURE.

D. ENLARGEMENT OF A PORTION OF THE GAUZE, FROM WHICH THE BANDAGF WAS MADE, TO SHOW METHOD OF WEAVING AND LOOSENESS OF TEXTURE. FROM ITS APPEARANCE IT WOULD SERVE ADMIRABLY AS AN ABSORBENT.

gives a striking illustration of the completeness of the preservation of the textiles when he says: "It was impossible to count the weft in this fabric with the testing lens ordinarily used in textile analyses. It was necessary to clamp an inch of cloth on the platform of a dissecting microscope and pick off the weft yarn with a needle. The operation took three and one half hours."

Murphy[15] gives other instances of perfect preservation in these sands, such as a "tuft of flamingo feathers still bright with the dawn-like flush that they may have had five centuries before." Many mummies with the brown skin shrunken against their bones are so light from age-long dessication that even the mummified body of the largest of the men can easily be held at arms length in one hand.

Résumé

The most ancient surgical bandage of the Western Hemisphere is to be regarded as an adaptation of existing materials to medical usage. The ancient people of Inca-land had not yet gained a definite conception of surgery, as such. They had, however, taken a few tentative steps towards the development of this branch of medicine and would doubtless have established in due time a surgical technique comparable with the development of their skill in architecture.

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10. See Crawford, M. D. C. *Op. cit.*, 1915, p. 64, and photomicrographs on p. 66.
11. See Crawford, M. D. C. *Op. cit.*, 1916, Gauze, p. 141. "In Peru this technique (gauze weaving) was carried to a remarkable degree of complexity."
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STUDIES IN PALEOPATHOLOGY

[Second Series, II]

EXCESS CALLUS FOLLOWING FRACTURE OF THE FORE FOOT IN A CRETACEOUS DINOSAUR

By ROY L. MOODIE, PH.D.

CHICAGO, ILLINOIS

MATERIALS

THE fossil bones showing exuberant callus following fracture of the metacarpals III and IV of a Cretaceous dinosaur are in the United States National Museum, where I examined them in the spring of 1925. These bones represent the herbivorous reptile known as Thespesius annectens. They were collected by Robert Butler from the Lance Formation, a phase of the Upper Cretaceous, near Castle Butte, seven miles northwest of Forsythe, Montana. They have been mentioned by J. B. Hatcher,[1] who called the animal Claosaurus, and discussed the skin impressions. Other members of the Hadrosauridae, the dinosaurian family to which Thespesius belongs, have shown skin impressions which have been described by Gilmore[2] and Osborn.[3]

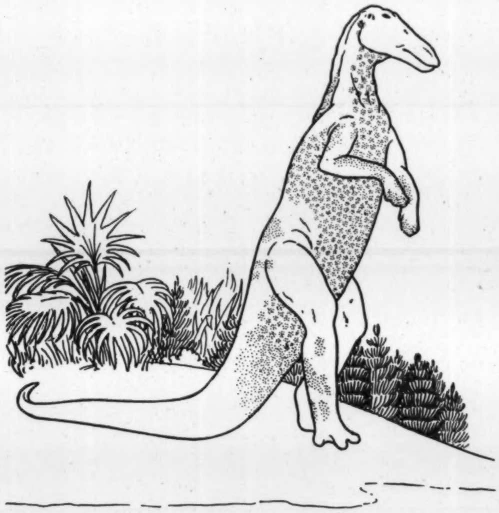

FIG. 1. A RECONSTRUCTION OF A HADROSAURIAN DINOSAUR SHOWING SIZE OF ARM AND PROBABLE POSE WHEN ON LAND. THIS FIGURE WAS USED BY OSBORN TO SHOW THE DISTRIBUTION OF THE SCALE PATTERN, FOLLOWING HIS STUDY OF THE FOSSILIZED SKIN OF THE "DINOSAUR MUMMY."

ACKNOWLEDGMENTS

I am indebted to Mr. Charles W. Gilmore, curator of Vertebrate Paleontology, United States National Museum, for permission to describe this interesting relic of Mesozoic surgical pathology. He has furnished the photographs of the foot bones (Figs. 2, 3, and 4) and supplied fragments from various places on the callus from which histological sections were prepared in the laboratories of the United States Geological Survey. The minute structure of the callus is shown in the four photomicrographs in Figure 5. Mr. Gilmore also supplied technical details needed for the complete description of this ancient lesion. He writes further: "In regard to the probable age of the Trachodont specimen, permit me to say that the animal seems to be fully adult. This conclusion is reached on account of the very large size of the individual, and the fully formed rugose character of the articular ends of the few limb bones that are present."

THE DINOSAUR

The dinosaurian family Hadrosauridae,[4] to which the genus Thespesius is assigned, is a group of bipedal reptiles in which the arm is still quite large, as may be seen in the restoration in Figure 1. Many of the bipedal carnivorous dinosaurs had the arm greatly reduced in size, being only a fraction of the size of the huge legs. Members of this family occur abundantly in the Cretaceous of the western states and in Canada. Related forms occur in Europe. They are thought to have been inoffensive, semiaquatic animals, attaining a height, when fully erect, of about fifteen feet. The full skeleton, however, may measure over thirty feet. The anatomy of the hand and arm is well known, having been fully described by Lambe[5] and Osborn.[6] It seems probable that the hand was fully webbed. Absence of dermal callosities from the palm, moreover, lead us to believe that the foreleg was not used in terrestrial locomotion, that is, the animal assumed an erect, bipedal gait when on land. The hand in Osborn's specimen was about twenty inches in length, including the carpus.

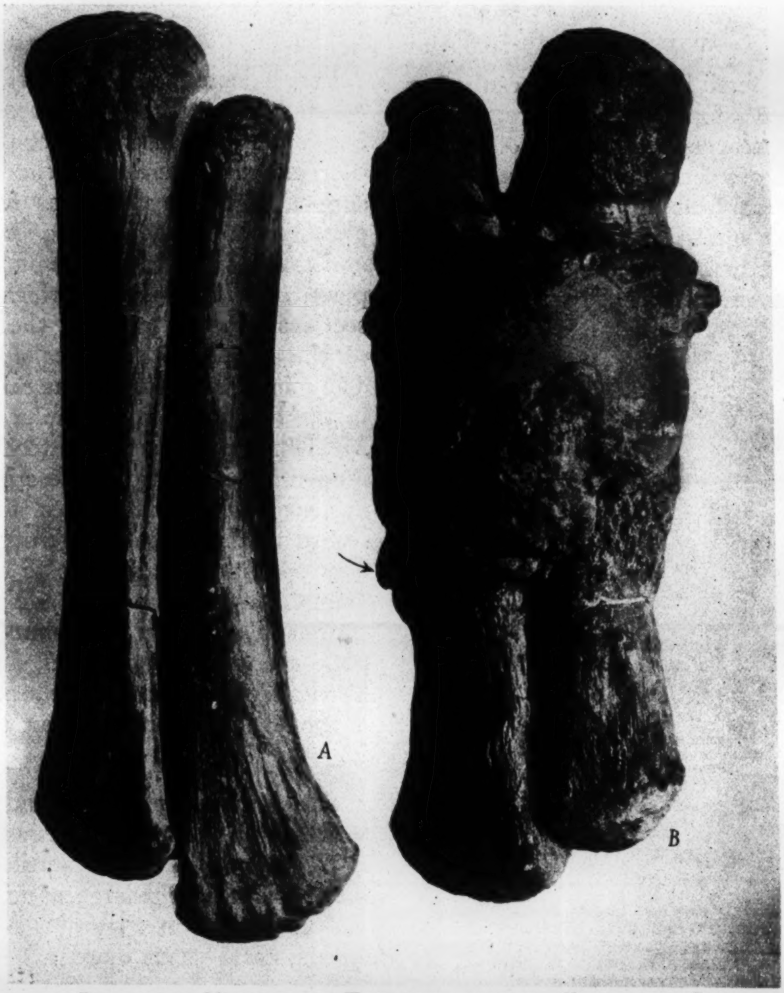

Fig. 2. Normal and Pathological Metapodials of Thespesius annectens, a Hadrosaurian Dinosaur from the Upper Cretaceous of Montana. A. Normal Metacarpals, Right Fore Foot. Viewed from in Front, Length 310 mm. B. Diseased Metacarpals iii and iv, Left Fore Foot. Viewed from in Front, Showing Extent of Excess Callus, Which Has Formed a Bridge over the Two Bones. The Light Area is Plaster Which Was Used to Fill an Opening Left by an Unrecovered Fragment. The Fracture at the Point of the Arrow Seems to Be Incompletely healed. The Adjacent Crack is a Post-fossilization Accident Due to Frost. Some of the Callus Surfaces Seem to Be of the Type to Which Cartilage was Attached. Little over ⅔ Natural Size.

NATURE OF LESION

We find ourselves somewhat at a loss to explain how this animal, with metacarpals about twelve inches long and two inches thick, could have suffered a fracture of the kind shown in Figures 2, 3, and 4, in a limb used only in swimming. The fractured metapodials with the huge mass of excess callus (Figs. 2B, 3, 4) measure 290 mm. in length as contrasted with that of normal bones of 310 mm., showing a reduction of 20 mm. in length due to vicious union. The callus is 15 mm. thick, the specimen 140 mm. high at level of fracture, circumference of callus 370 mm. The circumference of the two normal metapodials, shown in Figure 1A, is 200 mm. On account of the unique nature of the specimen it is thought worth while to give a complete description with illustrations of the mass of excess callus following vicious union of a fractured hand produced by violence many millions of years ago.

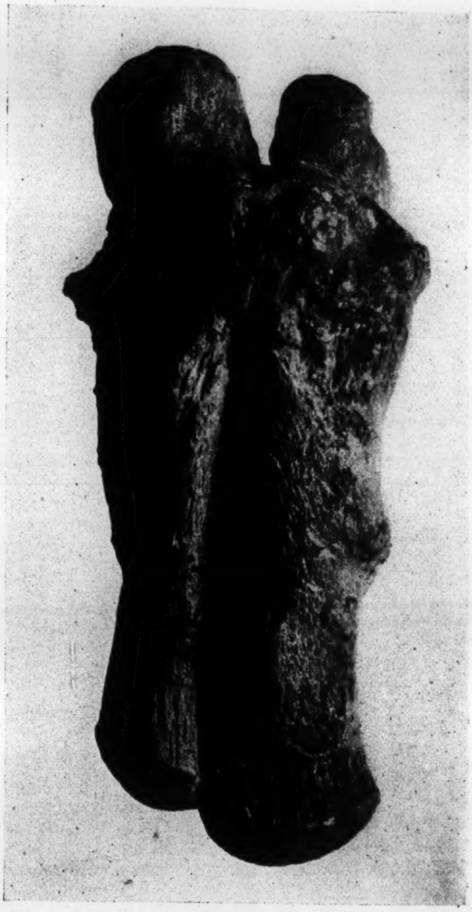

FIG. 3. FRACTURE OF MANUS OF THESPESIUS ANNECTENS, A HADROSAURIAN DINOSAUR FROM THE UPPER CRETACEOUS OF MONTANA. METACARPALS III AND IV, LEFT FORE FOOT, BACK VIEW, SHOWING FUSION OF BONES BY THE CALLUS. NEOPLASTIC GROWTH LESS EXTENSIVE ON THIS SURFACE. NO EVIDENCES OF INFECTION. THE CRACK AT THE LOWER THIRD IS A POST-FOSSILIZATION ACCIDENT, BUT IT OCCURS AT THE SAME LEVEL AS AN ANCIENT FRACTURE, SHOWN IN FIGURE 2B, AT THE ARROW. THIS DEFECT MAY HAVE BEEN PART OF THE ORIGINAL FRACTURE.

It is difficult to understand why such a mass of excess callus should have been produced since the animal was undoubtedly adult, as Mr. Gilmore has pointed out. The characters indicating this are the unusually large size of the bones and the well-formed articular surfaces. Dinosaur bones have no epiphyses. Excess callus occurs more frequently in children than in adults. Groves[7] states as a result of his experimental study that: "The young bones (of dogs and rabbits), in which the epiphyses have not yet joined, all formed callus excess but the older ones, whose natural growth had ceased, formed false joints." Yet this ancient dinosaurian lesion fails to agree with these findings. Infection is ruled out because the

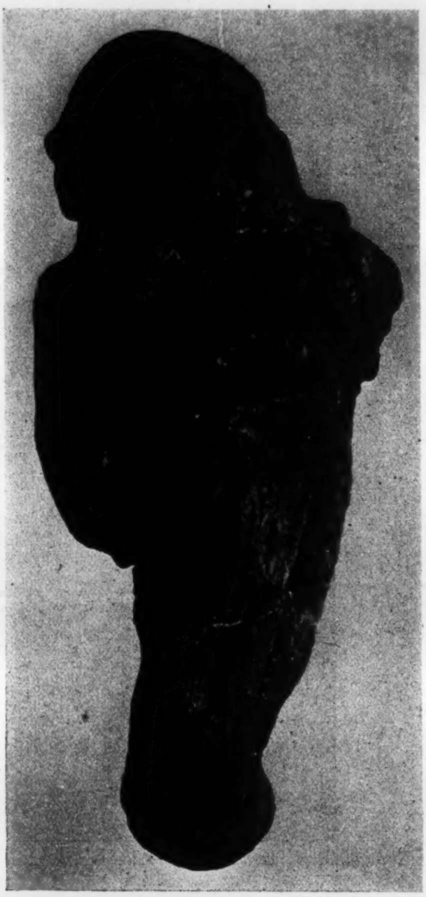

FIG. 4. FRACTURE OF THE MANUS IN THESPESIUS ANNECTENS, A HADROSAURIAN DINOSAUR FROM THE UPPER CRETACEOUS OF MONTANA. METACARPALS III AND IV, LEFT FORE FOOT, VIEWED FROM THE SIDE, SHOWING DEFORMATION CAUSED BY EXCESS CALLUS. THE MAXIMUM THICKNESS IN THIS VIEW IS 140 MM. (LITTLE OVER ⅔ NATURAL SIZE.)

metacarpals III and IV nowhere show evidence of sepsis. The fossilized callus in a few places shows, by the nature of the surface, the presence of cartilage, but on the whole the callus is well ossified. It may well be that this animal was kept in an unnatural state of activity, either by enemies or by a search for food, so that during the early stages of healing unusual activity kept the fractured limb in such a state of irritation that the early excessive callus became ossified before absorption could sufficiently reduce the mass. The present ossified mass would in that case be only a portion of the growth resulting from the injury. The entire growth would occupy only a few weeks' time, in spite of the supposedly sluggish nature of dinosaurs.

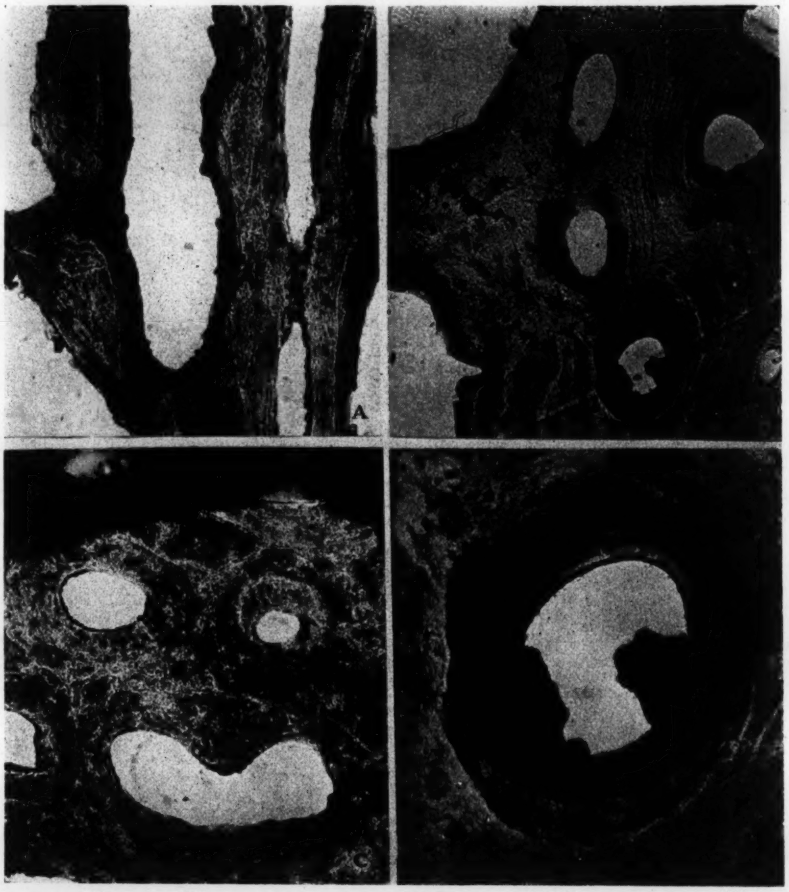

FIG. 5. FRACTURE OF THE MANUS IN THESPESIUS ANNECTENS, A HADROSAURIAN DINOSAUR FROM THE UPPER CRETACEOUS OF MONTANA.

HISTOLOGY OF THE CALLUS

A. TRABECULAE OF BONE SEPARATED BY EXTENSIVE VASCULAR SPACES. LONGITUDINAL SECTION. (×50). B. THE VASCULARITY OF THE CALLUS SEEN IN CROSS SECTION OF LARGE AND SMALL BLOOD CHANNELS AROUND WHICH THE BONE ELEMENTS (LACUNAE, LAMELLAE, OSTEOID TISSUE) ARE CONCENTRICALLY ARRANGED. (×100). C. CROSS SECTION OF OTHER VASCULAR CHANNELS IN ANOTHER AREA SHOWING CONCENTRIC ARRANGEMENT OF OSSEOUS ELEMENTS. (×50). D. HIGH POWER VIEW OF THE VASCULAR CHANNEL (HAVERSIAN CANAL) SEEN IN THE LOWER PART OF B. THE SPINDLE SHAPED LACUNAE, WITH BRIEF CANALICULI, ARE EVIDENT. THIS ARRANGEMENT OF MATERIAL IS RARE IN NORMAL DINOSAUR BONE, BUT FREQUENTLY SEEN IN LESIONS. A LARGE LACUNA IS SEEN IN CROSS SECTION IN THE LOWER LEFT HAND CORNER. (×300).

The union of the fractured bones was an angular one as may be seen by an examination of Figure 4. Some degree of pseudarthrosis is suggested by the condition of the bone at the point of the arrow. There is a reduction in length of about four-fifths of an inch, due to the vicious, angular union of the fractured metacarpals.

HISTOLOGY

The histology of the callus agrees very well with conditions seen in other fossil pathological lesions, which have been recorded elsewhere.[8] The osteoid tissue is abundant and readily discerned between the lacunae and lamellae (Fig. 5, A and B). In D of this figure is shown the tendency of fossil pathological bone to assume a concentric arrangement around a vascular channel. The significance of such an arrangement of osseous elements has been fully discussed in my forthcoming memoir[9] and need not be dealt with more extensively here. I believe the concentric arrangement to indicate a pathological condition.

RÉSUMÉ

The excess callus following fracture of metacarpals III and IV in an apparently adult hadrosaurian dinosaur, Thespesius annectens, from the Upper Cretaceous of Montana, is of a size and condition often found in young animals at the present day. Irritation due to unusual activity may have been the cause of the vicious, angular union and was a factor in the production of the mass of callus.

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STUDIES IN PALEOPATHOLOGY

[Second Series, III]

SPONDYLITIS DEFORMANS IN A CROCODILE FROM THE PLEISTOCENE OF CUBA

By ROY L. MOODIE, Ph.D.

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Materials

THE specimens, on which the following discussion is based, represent a crocodile from the Pleistocene deposits of Cuba. They were secured by Dr. C. C. Mook and are now to be found in the Los Angeles Museum of Natural History at Exposition Park. Mr. Wyman of that institution made the photographs, and the histological section was prepared in the laboratory of the U. S. Geological Survey.

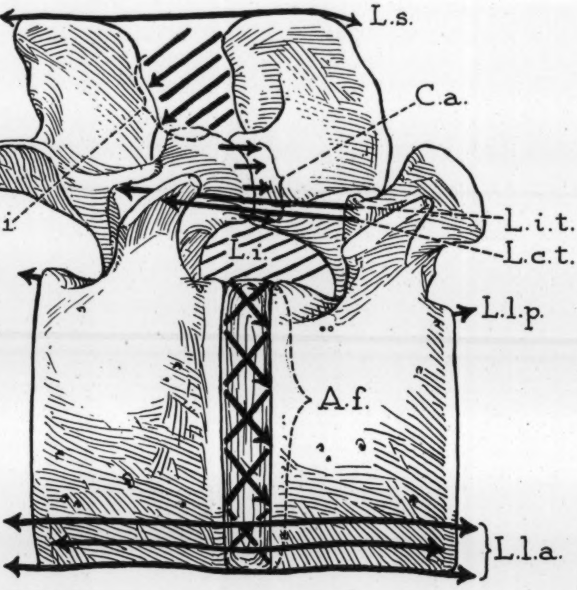

Fig. 1. A Diagrammatic Representation of the Ligaments in Man, as They Occur at the Point of Junction of Two Lumbar Vertebra. (*After Braus.*) A.f. Annulus Fibrosus; C.a. Capsula Articularis; L.c.t. Ligamentum Costotransversum; L.i. Ligamentum Interspinale; L.i.t. Ligamentum Intertransversarum; L.l.a. Ligamentum Longitudinale Anterius; L.l.p. Ligamentum Longitudinalis Posterior; L.s. Ligamentum Supraspinale.

The Condition

The condition known as spondylitis deformans has a wide geographical and geological range[1] to which the present case is an important addition. Ruffer[2] has described very fully this condition in a thoroughly petrified specimen, consisting of two posterior vertebrae of a crocodile from the lower Miocene of Egypt. He discusses all previously described cases of known antiquity. He further elaborated the subject by discussing the disease among ancient Egyptians.[3] Nothing has appeared on the paleopathology of this disease since my summary,[4] but Knaggs'[5] paper is a very useful contribution to the subject of recent pathology.

The pathogenesis of spondylitis deformans is still uncertain. Knaggs[5] has ascribed "the generalized affection" to a toxic factor, "but in ossification of the anterior common ligament alone, traumatism, in the form of ligamentous strain, is probably more important than toxins." The climatic factor may be ruled out by the distribution of examples of this disease from the hot dry tropics and from more temperate regions. There are many animal species which show evidences of this deforming arthritis, such as the apes, cattle, sheep, horse, giant wolf, sabre-tooth tiger, camel, cave bear, fossil Eocene mammals, crocodiles, dinosaurs and so forth. Among ancient civilizations the diseased condition was more prevalent in Egypt. The prehistoric Peruvians suffered hardly at all from this affliction. Among fossil animals the dinosaurs and the sabre-tooth tiger show the most extensive lesions. I do not understand how a toxic factor is involved in the case of a series of dinosaurian vertebrae in the United States National Museum. Here there exists a short series of bones near the "dragging point" of the tail in which nearly all the ligaments are ossified. Traumatism might account for the ossification of a few of these ligaments but not all. I hope to prepare a short study of these dinosaurian lesions soon.

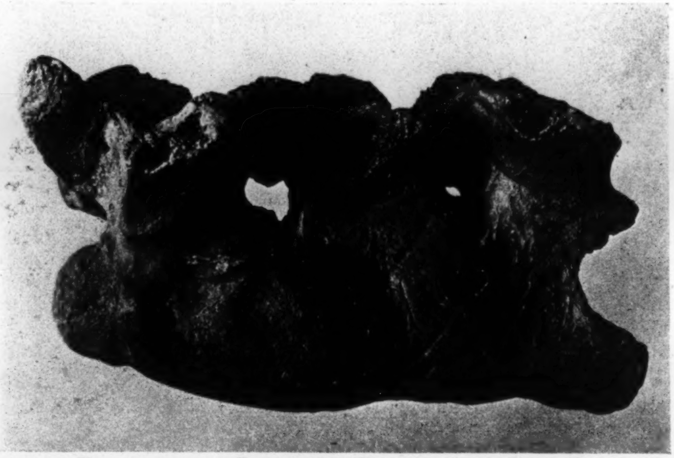

Fig. 2. Three Conjoined Vertebrae of a Pleistocene Crocodile from Cuba. The Ankylosis is Due to the Complete Ossification of the Common, Anterior, Longitudinal Ligament, and the Two Lateral Longitudinal Ligaments. This Condition, Known as Spondylitis Ossificans Ligamentosa, Leaves the Articular Surface Free. The Oval Openings in the Ossified Ligament to the Right are Spaces Which Lacked Ligamentous Material, or Else They Failed to Ossify for Some Unknown Reason. There is a Considerable Variation in the Occurrence of the Ligaments in Man, Great Gaps Often Occurring in Its Substance. The Condition Found in These Three Vertebrae was a Chronic Affair Which had Irreparably Stiffened the Back. The Lesion Undoubtedly Extended onto Other Vertebrae if We May Judge from the Great Projection of the Ossified Ligament to the Right. The Ligaments of the Arches and Spines Were Partly Affected.

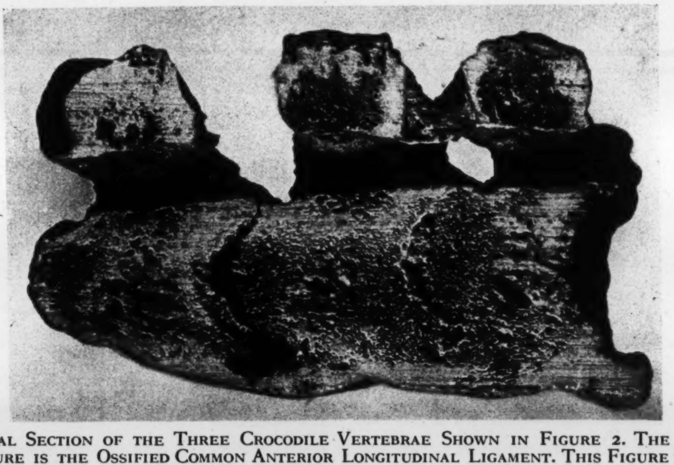

Fig. 3. A Sagittal Section of the Three Crocodile Vertebrae Shown in Figure 2. The Heavy Band at the Bottom of the Picture is the Ossified Common Anterior Longitudinal Ligament. This Figure should be Compared with Figure 306, Showing Vertebrae of a Horse, and Figures 310 and 311, Showing Human Vertebrae, in Knaggs' Paper Cited in the Text. The Disturbed Condition of the Material Forming the Centra of the Crocodile Vertebrae Suggests an Endosteal Disease of Uncertain Origin. The Articular Surfaces of the Crocodile Bones are not Smooth, as is the Usual Condition in Spondylitis Deformans, but Greatly Affected by Erosion in the Joint to the Left, While on the Right the Joint is Almost Obliterated by Coossification, Leaving a White Line to Indicate the Position of the Joint Cavity. The Three Vertebrae Measure 150 mm. in Length. The Ossified Anterior Ligament Measures 15 mm. in Thickness.

THE CROCODILE VERTEBRAE

The present examples of spondylitis deformans occur in the posterior dorsals (33, 34, 35) or anterior lumbars of an adult crocodile. The bones are all thoroughly mineralized and are quite heavy. They were evidently picked up from the talus since all are somewhat broken, yet they retain their characters sufficiently to justify description. The disease was far advanced as shown by the three conjoined bones measuring 150 mm. in length, pictured in Figures 2 and 3. The bones are firmly joined by the complete ossification of the ligamentum longitudinale anterium and the annulus fibrosus, shown in Figure 1. These ligaments are converted into an immense girdle of bone which at the anterior broken end measures 15 mm. in thickness. The pathological bone forms an incomplete ring almost surrounding the centra of the vertebrae. The anterior end of this block of three vertebrae shows a

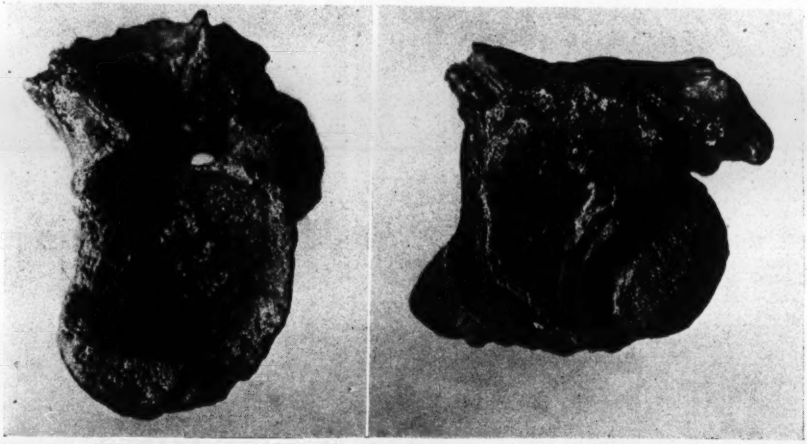

FIG. 4. LEFT. PHOTOGRAPH OF THE ANTERIOR END OF A CROCODILE VERTEBRA SHOWING AN ASYMMETRICAL DEVELOPMENT OF THE OSSIFIED LIGAMENT. THE LESIONS ARE NOT SO CONSPICUOUS AT THE SIDES AS THE ONE BELOW. THE BONE IS BADLY WEATHERED SO ONE IS UNABLE TO JUDGE WHETHER THE ARTICULAR SURFACE WAS INVOLVED. (PLEISTOCENE OF CUBA.)

RIGHT. LATERAL VIEW OF AN INTENSELY PATHOLOGICAL VERTEBRA IN WHICH ALL OF THE LIGAMENTS OF THE CENTRUM, SPINES AND ARCHES ARE OSSIFIED. (PLEISTOCENE OF CUBA.)

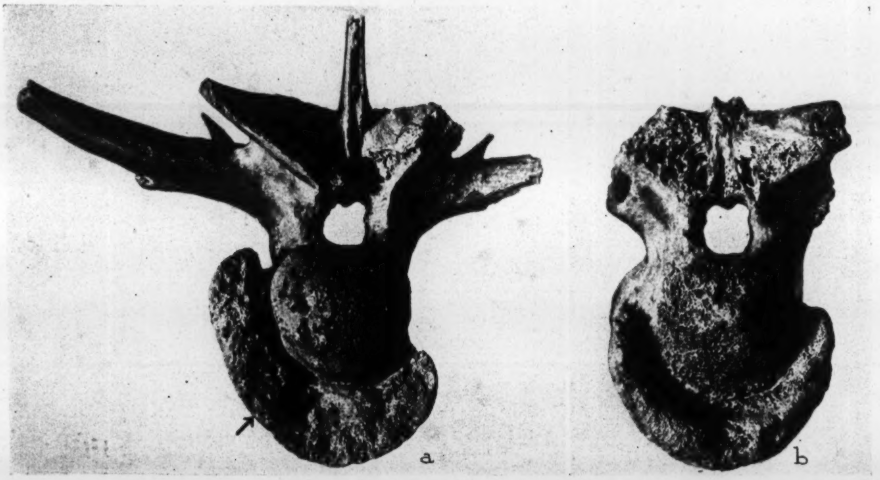

FIG. 5 A. POSTERIOR SURFACE OF A CROCODILE VERTEBRA SHOWING AN UNUSUAL THICKENING OF THE OSSIFIED LIGAMENTS, WITH ONE, THE RIGHT LATERAL, ENTIRELY UNOSSIFIED. THIS LEAVES THE LESION IN THE ANTERIOR COMMON LIGAMENT AND THE LEFT LATERAL LIGAMENT. A MICROSCOPIC SECTION (FIG. 6) WAS TAKEN FROM THIS LESION, AT THE POINT OF THE ARROW. (PLEISTOCENE OF CUBA.)

B. THIS VERTEBRA IS SOMEWHAT WEATHERED BUT IT STILL SHOWS CLEARLY ENOUGH THE COMPLETE OSSIFICATION OF BOTH LATERAL AND ANTERIOR LONGITUDINAL LIGAMENTS TO FORM THE LESION OF SPONDYLITIS DEFORMANS. THE ARCH SEEMS NOT TO HAVE BEEN AFFECTED. (PLEISTOCENE OF CUBA.)

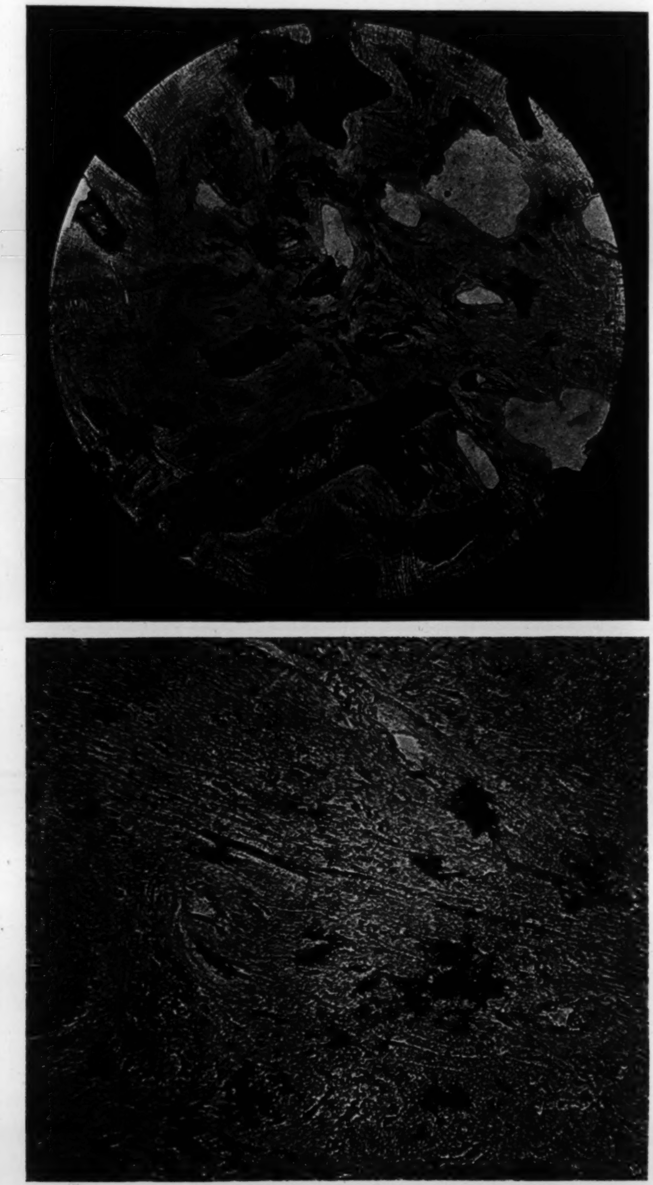

Fig. 6. a. Microscopic Sections of the Lesion Shown in the Left Picture of Figure 5. The Bone is Fairly Well Preserved. Many of the Osseous Lacunae are Greatly Distorted by Bacteria and Mold so that Each Lacuna Looks Like a Bit of Moss. Their Condition is Well Shown in B. The Bone is Highly Vascular. There are Portions of Eighteen Blood Channels Shown in A. The Usual Reptilian Arrangement of Lacunae, Lamellae and Osteoid Substance Prevail. (× 50.)

b. Portion of Field Shown Near the Center in A, Enlarged to Show Details of Normal and Distorted Lacunae. The Latter are Seen in the Black Moss-like Structures. Careful Examination Will Reveal Small Spindle-shaped Clear Spaces Which are Normal Lacunae. The Light Lines Running Diagonally Across the Field are Lamellae. The Hypertrophied, Infected Lacunae are not Regarded as Diseased but were Distorted Prior to Fossilization. The Condition is Interpreted as an Early Stage of Decay. (× 200.)

complete destruction of the articular surface, almost exactly of the same type as I have described in a Pliocene horse.[1] This disturbed condition of the articular surfaces likewise obtains in the vertebrae composing the block shown in Figures 2 and 3. I have seen also similar examples of such destruction in diseased vertebrae of the giant wolf from the Pleistocene, Rancho la Brea beds of California. The significance of the disturbance on the articular surfaces is not understood.

The vertebral arches in the block of three conjoined bones (Figs. 2 and 3) are ankylosed by bridges of bone, being the ossification of the ligamentum intertransversarium shown in Figure 1. All lesions have a dense structure and all are smooth. At the joints (Fig. 2) there are seen to be gaps in the ossified ligament. This is doubtless due to the absence of ligamentous material at these points. In one of the separate vertebrae the lesion is 23 mm. thick (Fig. 5*a*). Near this point, indicated by the arrow, a wedge of bone was cut for the histological sections shown in the photomicrographs (Fig. 6*a* and *b*). The block of three bones was doubtless part of a larger block as seen by the broken end (to the right in Fig. 2), though whether this larger piece consisted of more than one additional bone cannot at present be determined.

HISTOLOGY

An examination of the histological structure of the lesion reveals a high degree of vascularity (shown in Fig. 6*a*) where a number of blood channels may be seen in a limited field. There is a considerable quantity of osteoid tissue evident in the section. The normal lacunae are small, spindle-shaped and without extensive canaliculi. A few of the lacunar spaces, however, are greatly distorted by bacteria or mould (*Mycelites ossifragus*). This question has been fully discussed and illustrated in a memoir to appear soon.[6] Some of the distorted lacunae are to be seen near the center of Figure 6*a*, and greatly enlarged in Figure 6*b*. The invasion is not to be regarded as a diseased condition but the beginning of decay, indicating that the bones lay in an exposed situation for some time before fossilization set in. The lamellae are quite markedly developed and may be detected in the sharply defined clear lines.

RÉSUMÉ

A deforming arthritis, a typical example of spondylitis deformans, has occurred on the posterior thoracic and lumbar regions of a moderate-sized crocodile from the Pleistocene of Cuba. In all known vertebrates where this condition occurs the lumbar region is the most favored. On account of its more exposed position it would seem that trauma would account for most of the pathological conditions. So far as habitat is concerned, strongly developed lesions are known in man and mammals from the hot dry desert of Nubia, from the caves of Europe and from the lagoons of Cuba. This distribution would rule out the climatic factor. A conception of the pathogenesis will be aided by recording all cases of the disease and this discussion is offered as a contribution to the general knowledge of spondylitis deformans.

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[From Fernelius: Universa Medicina, Geneva, 1679.]

EDITORIALS

THE WILLIAM WOOD GERHARD GOLD MEDAL OF THE PHILADELPHIA PATHOLOGICAL SOCIETY

Since the foundation of the Philadelphia Pathological Society in 1857 (one of the oldest pathological societies, therefore, in this Country) it has been an important influence in promoting the scientific study of medicine in this city and has, it is hoped, contributed its bit to the sum of pathological knowledge. Even with the growth of the specialties it was able to maintain its position, deriving most of its support from scientifically minded clinicians in various branches, as well as from the smaller number of professional pathologists of the city's schools and hospitals. Endeavoring to interpret "pathology" in its broadest sense, the Society has been able to adapt itself to changing conditions and has included in its programs reports of functional and chemical pathology and experimental work, as well as the more strictly morbid anatomical presentations.

Of late years, however, the emphasis that has been placed on some of the scientific branches closely related to pathology has resulted in many places in an almost overshadowing expansion of teaching staffs and material for publication, with the consequent development of special societies and journals in these lines. Much of the work thus produced is really pathology and except for the forces indicated above might well have appeared in a pathological milieu.

It was, therefore, with peculiar pleasure that the officers of our Society welcomed a suggestion that the Society establish a medal, to be given as a reward for eminent work in pathology, in the hope that it might help to maintain the prestige of the subject and might stimulate additions to this branch of medical knowledge. In selecting a figure to honor, no one seemed more suitable than William Wood Gerhard, who was certainly one of the most important contributors to the subject in this city, and who, as we later learned, had been the first president of the first pathological society in this city, which antedated our own society by more than a decade, but only survived a few years. Realization of the plan of offering such a medal was made possible by the very generous offer of members of the Gerhard family to donate to the Society a die, cut by the Medallic Art Company of New York from a design prepared by Dr. R. Tait McKenzie.

The medal is of 14-karat gold, two inches in diameter, bearing on the obverse a portrait of Dr. Gerhard, in later life, full face, showing head and shoulders, with the dates of his birth and death, 1809–1872, in the field. Around it is a ribbon carrying the inscription, "William Wood Gerhard Medal." It is signed with the monogram, R. T. M., 1925. The reverse shows a tripod carrying a lamp of learning. Entwined about it is a serpent looking toward the light. In the field is the inscription arranged in parallel lines, "The Philadelphia Pathological Society Honors Zeal in Research."

The first award was made on November 12, 1925, in the Assembly room of the Pennsylvania Hospital, to Dr. William H. Welch of Baltimore. This room, directly behind the celebrated picture of Christ healing the sick, by Benjamin West, was peculiarly suitable, as it was in the old "picture house" of the hospital that the Society was founded and held its earliest meetings. Dr. Welch's address (which was also the annual Gross Lecture of the Society), on "W. W. Gerhard and the Differentiation of Typhoid from Typhus Fever," was a delightful presentation of this complex subject. Beside giving many more biographical details of Gerhard than are available to the casual reader, he definitely fixed the great importance of Gerhard's contribution to the differentiation of the continued fevers and found time as he went along to mold a charming setting of the medical knowledge of the period.

It is hoped that the Society will be able to make future awards on suitable occasions (certainly not more often than once a year) for really eminent work in pathology, whether an outstanding original contribution or for conspicuous service in advancing the subject in other ways. As there are no restrictions to the gift, the Society is free to make the award to investigators of any nationality or specialty. It is expected that they will customarily come to Philadelphia to receive the medal and deliver an address therefore, but on rare occasions the award will doubtless be made *in absentia*. The officers of the Society would be glad to receive suggestions of names of suitable candidates for the award, especially if accompanied by a statement of their qualifications.

E. B. KRUMBHAAR, M.D., PH.D

THE WILLIAM WOOD GERHARD MEDAL, BY DR. R. TAIT MCKENZIE.

AN INTERESTING MEDICAL CELEBRATION

The Medical College of the State of South Carolina celebrated its centenary on November 8, 1924, in a noteworthy manner. The Proceedings on the occasion have been published in a volume replete with interesting illustrations and containing a history of the institution. The College was organized under the control of the Medical Society of South Carolina and was first known as the Medical College of South Carolina. It opened its courses on November 8, 1824. The Faculty consisted of Drs. S. H. Dickson, H. R. Frost, T. G. Prioleau, James Ramsey, J. E. Holbrook and Edmund Ravenel. It went through the various vicissitudes which seem to have been common to all the medical schools founded in this country during the first half of the nineteenth century. As soon as it became prosperous a rival school was founded by dissenters from the Faculty, but in 1839 the two schools coalesced under the name of the Medical College of the State of South Carolina. The College enjoyed great prosperity until the outbreak of the Civil War. After the War it reopened, but owing to the poverty of the country the number of students that applied was so small that it was decided to make the tuition free, and as a free school it continued until 1876, when payment for tuition was once more demanded. Since that time the College has flourished and has grown into a really great institution. The special feature of the celebration of its Centenary to which we would direct attention was an interesting series of tableaux vivants representing scenes in medical history. Photographs of some of the characters and the tableaux are reproduced and show much taste and discrimination. Part I showed various characters from a Druid down to Harvey, who figured in the progress of medicine. Part II exhibited scenes illustrative of modern medicine, such as the Discovery of Bacteria by Van Leeuwenhoek, Inoculation, Vaccination, the Germ Theory, and so forth, concluding with "Florence Nightingale's Dream" which shows a number of nurses illustrating the diversity of the activities of that branch of the profession of healing.

Such tableaux have been used at similar celebrations in other countries, but the idea has borne but little fruit in the United States. They have great educational value and when artistically carried out never fail to arouse the enthusiasm of an audience.

CORRESPONDENCE

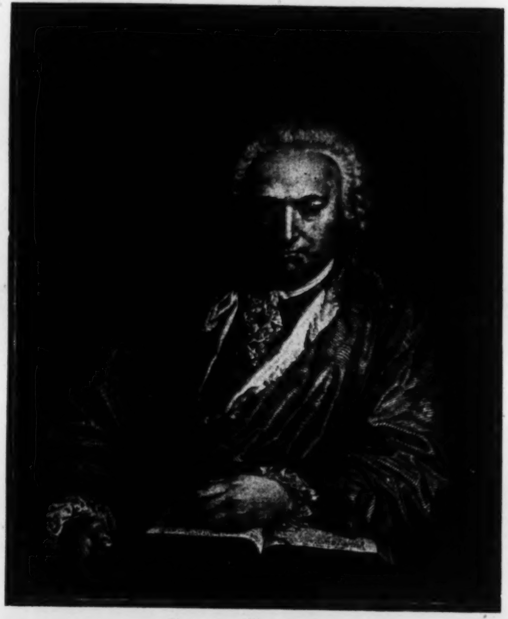
To the Editor:

To the kindness of my friend and former student, Dr. Raymond de Saussure, I am indebted for this unpublished letter of the great Genevan naturalist, Charles Bonnet, to the equally great naturalist Horace Benedict de Saussure, relating to the death of Albert von Haller of Berne. This letter is interesting from the viewpoint of medical history; therefore I shall reproduce it *in extenso.*

Genthod, Tuesday morning,
16 of December, 1777.

What a friend we have just lost! What a man we have to mourn! The dear, the virtuous, the Great Haller is no more! Read, my dear friend the two enclosed [letters] from his younger [brother], and contemplate with me the last moments of this respectable man. He had already prepared me for this sad separation, and wrote me [regularly] up to the day he took to his bed. I send you [enclosed] his last letter and that of the 20th of last month, which he ended by taking leave of me and giving me his benediction. My heart receives it with tender gratitude from an upright man and a friend of twenty-three years. How many times has he confided in me his pleasures and his griefs, his hopes and fears! I possess more than eight volumes of his precious letters. You will see in the last one I enclose, how great was his Christian humility. How instructive is this spectacle of deep humility and so great a Genius for those worthy to enjoy it. I neglected nothing in my replies [to his letters] to console, fortify, support and strengthen his beautiful Soul, alarmed at the prospective of redoutable eternity. I showed him that Religion is our most faithful, our tenderest and our best Friend; in other words, as the most touching trait of the paternal goodness of the GREAT BEING, and, if I dare to say it, the most amiable of all beings. You know, my dear Friend, the strong Orthodoxy which our excellent Friend professed: it was like that of his equal the great Pascal; and it is astonishing that the Genius of these two men, unique of their kind, was not crushed under the weight of such orthodoxy.

I send this by special messenger in order that you may write to the afflicted Family who, with [the city of] Berne loses its greatest ornament; what saý I! Since the immortal Léibnitz, there has not been in all Europe a brain like that of our Haller. The learned of Switzerland and Europe have this year experienced two irretrievable losses: they have lost Lambert and Haller, and these two men alone encompassed the entire empire of Science.



Charles Bonnet.

They are also soon to lose the excellent Sulzer and I shall in his person lose one of my best and most illustrious Friends.

Accept, my good friend, the tenderest wishes of my heart.

This letter is not signed, because at the time Charles Bonnet was already completely blind.

Jean Henri Lambert, referred to in the letter, was born at Mulhouse in 1728, and died at Berlin in 1777, where he had been called by Frederick II of Prussia in 1764. He was the perfect type of encyclopedist and it is said of him that he was one of the most learned men of the eighteenth century. He was known by his works on mathematics, astronomy, physics and metaphysics.

In 1777, there were two Sulzers living, both originating from Winterthur, Switzerland. One, Jean Gaspard (1716–1777) was physician to the Duke of Saxe-Gotha. He is known for his "Historia morborum quorumdam Helvetiis endemicorum, Strasbourg, 1740," as well as his attempt to introduce inoculation for smallpox into Germany.

The other Sulzer, Jean George (1720–1777), younger brother of Jean Gaspard, was the friend of John Gessner the naturalist. His is known especially for two works: "Essais de physique appliqué a la morale" and "Théorie universelle des Beaux-Arts," published in 1772.

He lived in Berlin where he had been called by Frederick II, and it is probably this Sulzer referred to by Bonnet in his letter, because Jean Gaspard Sulzer, becoming ill in 1775, undertook a trip to Italy of which he has left us an account entitled: "Journal d'un Voyage fait en 1775 et 1776 dans les Pays méridionaux d'Europe," La Haye, 1752.

When he returned from his travels, Sulzer took cold in the Swiss mountains and passed the year 1777 taking care of himself in his native land. Consequently, there is every reason to suppose that this is the Sulzer referred to by Bonnet.

I have in my collection a very rare and beautiful print of Charles Bonnet which is here reproduced.

CHARLES GREENE CUMSTON, M.D.

BOOK REVIEWS

MALE INFIBULATION. By Eric John Dingwall, M.A. John Bale, Sons and Danielsson, Ltd., London, 1925.

This erudite little volume, the first of a series of "Studies in the Sexual Life of Ancient and Medieval Peoples," deals with a practice prevalent among the Greeks and Romans and many other ancient peoples to which the references in ancient literature are so obscure, though frequent, that much doubt prevails as to the exact method by which the process was carried out. Mr. Dingwall, from a study of the available literature bearing upon the practice, has been able to clear up many obscure points and dispose of many disputed ones. The "Epigrams" of Martial and the "Satires" of Juvenal contain many references to infibulation. The earliest description of the method of performing the operation is found in the "De Medicina" of Celsus, which was written in the first half of the first century of the Christian era. From a study of these authors and of Oribasius and others who wrote later, Dingwall concludes that the operation consisted in passing a ring, or a contrivance somewhat like a modern safety-pin or brooch, though the prepuce. The object was to prevent coitus, and the reasons for which it was done were: (1) to preserve the quality of the voice in professional singers or actors, in accordance with the ancient idea that sexual intercourse weakened or impaired the vocal organs, (2) to enhance the sexual powers by enforcing a period of continence, (3) to increase the prowess of gladiators and acrobats by compelling them to refrain from sexual intercourse, which was believed to weaken them. The apparatus employed was usually made of metal, gold, silver or bronze, occasionally some material such as silk or flax was used.

The practice is frequently referred to in medical writings down to the time of Dionis, the French surgeon who flourished in the latter part of the seventeenth and early part of the eighteenth century. Dionis refers to it with some contempt as being occasionally used to prevent masturbation. Curiously enough this use of infibulation was brought into prominence again in the closing years of the eighteenth century by Vogel and Jaeger, and especially by Weinhold, professor of surgery at Halle, who, in 1827, wrote a book in which he advocated infibulation as a eugenic measure of the greatest value. The Greeks practiced a form of infibulation which Dingwall calls *ligatura praeputii*, which consisted in placing a ligature around the prepuce and tying the ends to a sort of waistband. He also describes other methods used by aborigines in Africa and elsewhere. The book is a most careful study of a very ancient and widespread custom.

F. R. PACKARD, M.D.

MONUMENTA MEDICA. Under the general editorship of Henry E. Sigerist. Vol. II. FASCICULO DI MEDICINA, Venice, 1493. With an introduction, etc., by Charles Singer. VOLUME III. THE EARLIEST PRINTED LITERATURE ON SYPHILIS FROM THE YEARS 1495–1498. A COMPLETE FACSIMILE WITH AN INTRODUCTION AND OTHER ACCESSORY MATERIAL. By Karl Sudhoff, Adapted by Charles Singer. R. Lier and Co. Milan, 1925.

The first volume of this truly invaluable series of reprints of rare and important medical works, the "Fasciculus Medicinae" of Johannes de Ketham, was reviewed in the ANNALS (Vol. VI, p. 241) and the hope was announced that so daring and magnificent an enterprise would not lack the support it so thoroughly deserves from the medical profession. The second and third volumes in the series more than maintain the promise held out at the time of publication of their predecessor. Such works are only produced at an enormous expense and the price at which they are offered to the public is surprisingly low for the value given. No medical library can afford not to possess them and to students of medical history or to teachers of medicine they will be of such constant value, not only for the facsimiles themselves but for the notes which illustrate them, that they will be desired for frequent reference in private collections.

The "Fasciculo di Medicina," printed at Venice in 1493 in the Italian language, was a second edition of the "Fasciculus Medicinae" of Johannes de Ketham, of which the first edition had been printed in 1491 in Latin. It differs in many important aspects from the first edition, which has already been reproduced as Volume I of the "Monumenta Medica" under the able supervision of Sudhoff and Singer, especially in that there is added to it the "Anatomy of Mundinus." Volume II of the "Monumenta Medica" is in two separate parts. The second is a facsimile reproduction of the "Fasciculo di Medicina" with its most interesting illustrations. In the first part Dr. Singer gives us a translation of the text of Mundinus into English and a large store of information on medieval medicine which merits detailed description.

Singer begins with a description of the "Fasciculo," describing the origin of the work and the points which give it such importance. He then describes the illustrations and annotates the text. The frontispiece is a representation of Petrus de Montagnana studying at his desk. The "Fasciculo" is a collection of didactic medical treatises put together by him, and to which, because as Singer says he was an anatomist, he has added the work of Mundinus. The details of the frontispiece are interesting. In the foreground is a representation of his waiting room in which are three patients. On a shelf are displayed a number of medical works, Aristotle, Hippocrates, Galen, Avicenna and Haly-Abas. In a place of honor near his hand is Pliny. The most modern work displayed is the "Conciliator" of Peter of Abano. Singer's description of this frontispiece is typical of the delightful way in which he has annotated the entire work. Every book in the library of Petrus de Montagnana is described as he would have had it for his use. He tells us which of the Greeks the old physician could have studied only in translations made by the Arabians and what printed editions would have been available to the reader in 1493. The same erudite but fascinating kind of description is given of pictures illustrating a urinoscopic consultation, a disease man, a zodiacal man, a vein man, et cetera. Especially informing is Singer's study of the picture of the abdominal viscera of a pregnant woman. It leads to an opening-up of the subject of sex physiology in connection with anatomy as taught in the fifteenth century. A dissecting room picture is not only interesting from the medical point of view but also as an early experiment in printing in colors. It is in black, green, yellow and red, laid on by means of stencils.

A very complete study of the editions, art and language of the "Fasciculo" follows.

The study of the "Anatomical and Physiological Methods and Knowledge of Mundinus" discusses the entire subject of medieval anatomy. Singer shows that the assertion so often found in textbooks, that the Emperor Frederick II ordered that all medical students should attend anatomical demonstrations, is erroneous. His edict only ordered that they should attend a course in anatomy, and, as Singer says: "This edict refers, however, only to the inclusion of anatomy in the curriculum, and there is no reason to suppose that it was studied more practically than other subjects at a time when books were the only mechanism of instruction." He adds: "A statement has further been made that Frederick further gave orders that every five years a corpse should be handed over to the physicians for dissection. I have been unable to trace the statement to its source and more than suspect its authenticity." The Venetian Senate issued a permit for an annual dissection in 1308, and Mundinus says in his book that he dissected the body of a woman in January and another in March, 1315. Singer points out that though the famous Bull of Boniface VIII in 1300 was probably only intended to prohibit the boiling of the bodies of those who died in foreign lands, as when crusading, for convenience of transportation for burial at home, nevertheless the clergy and anatomists interpreted it as prohibiting human dissection, and thus by it the development of the study of anatomy was retarded for many generations. It is a fine thing to have available so excellent a translation of Mundinus into English as that of Dr. Singer. The text is fully annotated and the passages quoted by Mundinus from other authors are fully explained in notes, and a useful glossary of terms used in the text is appended. At the end of the work is a beautiful atlas of upwards of eighty illustrated figures from manuscript and printed sources.

The magnificence with which the two parts of the second volume of the "Monumenta Medica" are illustrated and printed deserves especial mention. The figures are most artistic, and the printing worthy of the best traditions of Italian typography, which is making a large statement.

The third volume of the "Monumenta Medica" contains ten tractates on syphilis printed between the years 1495 and 1498. They are produced in facsimile, each complete in itself, the group preceded by an Introduction by Sudhoff, which has been translated and adapted into English by Singer. These tractates are the ten earliest publications on syphilis and are consequently of vast importance. As Sudhoff says: "They exhibit the earliest attempt to treat the newly recognized scourge of humanity as a separate and special medical topic. They illustrate too how the new art of reduplication—for which the world was indebted to Coster and to Gutenberg—had become an instrument for the advancement of knowledge. The convenient and effective form of publicity that we call "printing" played no small part in the new recognition of an ancient evil." These tracts also illustrate the close intellectual communication between Italy, Spain and Germany, and are remarkable as being original writings handed over by the author to the publisher, and not merely the printed versions of works written by writers long since dead. To illustrate the latter point Sudhoff points out that in 1471 and 1472, the first years in which distinctly medical books were printed, there appeared from the press, Mesuë, the "Antidotarium" of Nicholas of Salerno, the "Conciliator" of Peter of Abano, who died about 1318, and the "Regimen Sanitatis" of Taddeo of Florence, who died in 1305. All four had existed in manuscript form for many generations. A few years later there appeared some works under the names of living writers such as Ferrari da Grado and Bagellardi. They were, however, merely compilations from the writings of more ancient authors. Even the rules for health and regimens against the pest were only printed editions of old writings which had been in circulation in manuscript. Sudhoff gives a few exceptions which only serve to emphasize the general rule. The ten tracts necessarily vary greatly in their intrinsic value as contributions to medical science but they are all worthy of careful perusal by anyone who would study the subject.

The first pamphlet is by Conradus Schellig and bears the title "In pustulas malas consilium." It was published at Heidelberg in 1495, and is written in the conventional form employed in the tractates against the pestilence. In it syphilis is termed the French disease. The second, by Joseph Grunspeck, was published at Augsburg in 1496 with the title "Tractatus de pestilentiali scorra sive mala de franzos," and is a commentary on a poem by Sebastian Brandt, the author of "Das Narrenschiff," which had been published in 1494 entitled "De pestilentiali scorra sive mala de Franzos, Eulogium." Grunspeck ascribes great importance to planetary influences in relation to syphilis. He advises a mercurial ointment and speaks of the stomatitis which followed the overuse of mercury. Sudhoff next reproduces the same treatise in the German text, which was published at Augsburg, 1496. The fourth pamphlet was written by the famous Niccolo Leoniceno when he was seventy years old and published at Venice by Aldus Manutius in 1497. Leoniceno declares that syphilis is not a new disease, that outbreaks of the malady have occurred from the most ancient times. Caspare Torrella, the author of the fifth tractate, was a native of Valencia. He was body physician to Pope Alexander VI, and published this "Tractatus cum consiliis contra pudendagram seu morbum gallicum" at Rome in 1497. The dedication is addressed to Caesar Borgia, the son of Alexander VI, who in 1492 had been made a cardinal by his father, and had been treated by Torrella for syphilis. Torrella attributes the disease to the wrath of God and the influence of the stars, but he adds that it began in France in the year 1493, whence it travelled to Spain, then to the islands in the Mediterranean, and later to Italy. Sudhoff makes the important statement: "There can be no doubt that as early as the fourteenth century there was in Southern France a clear conception of Syphilis as a condition distinct from Leprosy, Eczema and other chronic diseases of the skin. It is probable that it was in Southern France that this knowledge first became common property. This would explain how the name *Mal Franzoso* came to be given to the Disease." Torrella relied on mercurial ointment in the treatment though later he gave it up. Sudhoff considers this treatise of Torrella the most valuable of the ten tractates. The next tract, by Hans Widmann of Tubingen, was published in 1497 at Strassburg and Rome. Its title is "De pustulis et morbo qui vulgo mal de fransos appellatur." He warns against cohabitation with those who have the disease, and totally disregards the wrath of God or any planetary factors in its etiology. Nothing save his authorship of the tract "De morbo quem gallicum nuncupant," published at Ferrara in 1497, is known of Corradino Gilino. In order to counteract mercurial saturation he recommends the application of a red-hot iron to the coronal suture, probably because the brain was supposed to be the source of the pituita or phlegm. The eighth tract, "A mala franczos morbo Gallorum, preservatio ac cura," published at Vienna in 1498, is by Bartholomäus Steber, a Viennese professor. It possesses no particular value although accompanied by an interesting frontispiece of a syphilitic man and woman lying in bed and undergoing treatment by two physicians. Natale Montesauro of Verona published in that city in 1498 his tract "De dispositionibus quas vulgares mal franzoso appellant." Of it Sudhoff says: "For those looking for an example of the most barren side of Scholasticism this would form no bad illustration." It was intended as an answer to the tractate of Leoniceno which precedes it in this volume. Montesaura in turn was attacked by Antonio Scanaroli of Modena, who published in that city his "Disputatio de morbo gallico" in 1498. He was a pupil of Leoniceno and would destroy those who ventured to oppose his old master.

Aside from the subject of syphilis the light thrown by these old pamphlets on the contemporary medical thought and practice of the time is most interesting. Most of the ideas and theories they contain are as dead as their writers but they once possessed real importance. *Sic transit gloria mundi.*

FRANCIS R. PACKARD, M.D.

REMÈDES CONTRE LA PESTE—FAC-SIMILES, NOTES ET LISTE BIBLIOGRAPHIC DES INCURABLES SUR LA PESTE. Par A. C. Klebs et C. Droz. E. Droz, Paris, 1925.

This volume is the first of a series of scientific documents of the sixteenth century which it is proposed to republish. Although much smaller in size and more modest in form it is worthy of being classed with the "Monumenta Medica" in point of value to the student of medical history, and the scholarship with which it is edited is of the very highest order.

The first facsimile is that of "Le Regime de l'epidemie et remede contre icelle" of Jean Jasme or Johannes Jacobi, which was printed at Lyons about 1476, and of which there is but one copy known to be in existence, that in the Marseilles Library. The editors have compiled the text from a manuscript in the Bibliothèque Nationale at Paris. Next to it is reproduced the "Remede tresutile contre fiévre pestilencieuse," attributed to Bishop Canute de Vësteras but really composed by the same Jean Jasme or Johannes Jacobi. It is reproduced from the edition printed probably by Antoine Caillaut at Paris towards the end of the fifteenth century, the example from which this is taken being in the Bibliothèque Mazarine.

The Author of these tractates died many years before the invention of printing and his work circulated after his death in both manuscript and print under other names than his and with varied titles. The labors of the present editors have revealed the true facts in the case and they are able to furnish some interesting information concerning the Author. Johannes Jacobi is the latinized form of Jean Jasme, the latter being a usual form for the name Jacques in the *langue d'oc.* He wrote the "Regime" about 1357 according to a rebus discovered in the work by the editors. In 1364 his name is found in the registers of the University of Montpellier. Among his colleagues were Gerard de Solo, Gui de Chauliac, Bernard of Cologne, Raymond Chalmel, Jean Tournemire and Valescus of Tarento. In the year 1364 Bernard of Cologne, who was chancellor of the University, died and the Bishop of Maguelone appointed Jean Jasme to the position. The Bishop's action was most irregular, the Faculty having the right to choose and nominate the candidate to the Bishop. According to a bill of Pope Clement v (1308) the nominee must have received the votes of at least two-thirds of the Faculty. There had been some kind of nomination of Jean Jasme by some of the Faculty but he had not received the necessary two-thirds of their voices. Jean de Tournemire, who had also sought the position, appealed to the Pope, and the latter appointed Jean de Blandiac, a cardinal, to settle the affair. The latter decided that Tournemire and his friends in the Faculty were right in their contention and declared the appointment of Jasme void, but on the other hand he proceeded to appoint him anew to the position, accompanying this action, however, by many protests that he did not wish to infringe on the rights of the Faculty. The reason wherefore is to be found in the fact that Johannes Jacobi was not only physician to Pope Urban v, but also to King Charles v. Subsequent records show that the two contestants seem to have been reconciled; at least they met one another in consultation, and after the death of Johannes Jacobi in 1384, Tournemire succeeded to the position of chancellor.

Johannes Jacobi wrote his tractate "Tractatus de pestilentia" in Latin. The "Remede tresutile contre fiévre pestilencieuse" is nothing more than this tractate translated into French. It was probably attributed to Bishop Canute of Vesteras in order to give it the prestige of the name of a high ecclesiastical dignitary.

The title pages and colophons of two other important treatises on the plague are reproduced. The first are from the "Regime contre l'epidimie" of Thomas le Forestier, the second from the "Regime contre la pestilence" of the physicians of Bâle.

Let us trust the rest of the series of sixteenth century scientific documents will prove as interesting as those reprinted in this little volume, which really date from the century before.

Francis R. Packard, m.d.

The Evolution of Anatomy, a Short History of Anatomical and Physiological Discovery, to Harvey. Being the substance of the Fitzpatrick Lectures delivered at the Royal College of Physicians of London in the years 1923 and 1924, by Charles Singer, m.a., m.d., d.lit., f.s.a., Fellow of the College, Lecturer in the History of Medicine in the University of London (University College). Alfred A. Knopf, New York, 1925.

Although an enormous amount of material bearing upon various aspects of the history of anatomical science has been written there was great need for an authoritative conspectus of the subject in its entirety and continuity and this want Singer has succeeded in filling in a most delightful manner. Volumes have been written on the life and works of great anatomists such as Vesalius, Harvey and Hunter; many monographs and books detail the history of anatomical research on special lines, such as the circulation of the blood, the lymphatic system, or the special sense organs, and the history of anatomical schools has been very amply written up; but a history of the entire science from its beginning and in all its branches so related as to weave the story into a continuous narrative has been sadly lacking. Singer states that in order to lessen the bulk of his work he has omitted references and bibliographies from its pages, but we may readily recognize in reading it that he has gone to original sources for its contents and that all the statements it contains are authoritative and can readily be verified. In the Preface Singer indicates that we may hope to see the work continued to a later date than Harvey's time and also that the present work may yet be expanded so as to contain material necessarily excluded from a book of the size into which this is compressed, because from cover to cover this volume is all meat and splendidly served for our delectation and digestion.

Singer divides the history of Anatomy into four great epochs or stages. The first is from the Greek period to 50 b.c., comprising the Hippocratic period, Aristotle and the Alexandrians. Although, as Singer says, "our anatomical tradition, like that of every other department of rational investigation, goes back to the Greeks," yet before their time men groped at some ideas as to anatomical structure, as evinced by the drawings found in the homes of the cave dwellers, and the Egyptians and the Mesopotamians had quite distinct conceptions of anatomy of a crude sort. The earliest actual records of anatomical observations, however, are to be found in the fragments which remain to us of the writings of Alcmaeon, a native of the Greek colony of Croton, who flourished about 500 b.c. He "began to construct a positive basis for medical science by the practice of dissection of animals. He discovered the optic nerves and the tubes called in after ages by the name of Eustachius." Singer reviews the work done by his successors among the Greeks. During this epoch the most important contributions to Anatomy were those made by Aristotle, whose studies and descriptions of the anatomy of various animals, and especially fishes, are wonderful for their accuracy. Herophilus and Erasistratus, the fathers of the Alexandrian school, made many notable discoveries. Herophilus distinguished between arteries and veins, divided nerves into motor and sensory, described the brain as the central organ of the nervous system, and also described the meninges and the torcular Herophili, to which his name has been given. He distinguished the cerebrum, the cerebellum and the calamus scriptorius, the latter of which he named. Erasistratus described the lacteals, stated that both the arteries and veins arose from the heart, and Singer thinks "came very near discovering the circulation of the blood"; he certainly realized that communication existed between the arteries and veins.

Singer dates the second epoch in anatomical history from 50 B.C. to A.D. 1050. "With the advent of the Empire and of Imperial ideas the tone of Science changes. There is a waning in enthusiasm for all save "useful knowledge" and Singer shows how this so-called "practical" outlook proved disastrous to the progress of science for many centuries. He refers to the works of Celsus, Lucretius and Pliny, and the other writers who preceded or were contemporary with Galen (*circa* A.D. 150–200), the "Prince of Physicians" whose empire over medical thought was supreme for more centuries than that of any other medical writer. Singer gives a concise but remarkably clear and complete description of Galen's anatomical and physiological views, and in a few vivid pages relates how the curtain abruptly descended on scientific progress when Christian fanaticism deliberately inculcated the doctrine of neglect of all material studies in the overwhelming need to fit the soul for the life to come. For many centuries there is no evidence of any progress whatever in the sciences of anatomy and physiology.

The third epoch, from 1050 to 1250, is marked by the prominence of the Arabians in scientific matters. From the eighth to the thirteenth century the Arabians dominated in intellectual matters, and Avicenna, Hali Abbas, and Rhazes are the leading medical writers until the year 1500. Their works were disseminated throughout Europe by translations into Latin made by Constantine the African, Gerard of Cremona and many others of lesser note. During the thirteenth century occurred the development of the great universities of Italy, and with the opening of the fourteenth century human dissection first began to assume its proper importance in the study of anatomy. Singer goes very fully into the early history of human dissection and the work done by Mondino, Achillini, and the early dissectors, including the artists, Leonardo da Vinci, Michael Angelo, Dürer and Raphael. He then gives descriptions of the early illustrated books on anatomy, the "Anatomia" of Mondino, and the books of Berengarius, Dryander, and Estienne, and thus by Sylvius to the work of his great pupil Vesalius.

The fourth and last epoch which Singer studies he dates from 1543, the year in which Vesalius published his "Fabrica," to 1628, when Harvey published his "De Motu Cordis." It is impossible in the space at our disposal to discuss at length the delightful pages in which Singer writes the history of the wonderful development of anatomical science during this great epoch in its history. We know of no better description of the work of Vesalius and his followers, Realdus Columbus, Fallopius, Fabricius, and so forth. Not only is the story well told, that has been done by others, but the significance and continuity of the work of all the individual anatomists is brought vividly before the reader. With Harvey the story is concluded.

Dr. Singer's labor has evidently been performed *con amore.* His erudition has given him the material and his skill as a writer has enabled him to produce the story of the development of one of the great fundamental sciences as a vivid tableau. The book will prove invaluable as a reference handbook for students and teachers.

FRANCIS R. PACKARD, M.D.

THE HEALING GODS OF ANCIENT CIVILIZATIONS.

By Walter Addison Jayne. xxxix + 569 pp., 7 pl. 8vo. New Haven, Yale University Press, 1925.

An examination of the exhaustive bibliography appended to this volume will confirm the fact that it is the first complete survey yet made of the medical mythology of antiquity. Books about the gods, and particularly the medical gods, of different races and nations have been published in plenty, but the present study covers no less than seven ancient civilizations, comprising in fact, the healing gods of the ancient Egyptians, Assyro-Babylonians, pagan Semites (Phoenicians), Hindus, Persians, Greeks, Romans and Celts. As the author states in his preface, the archeological and philological researches which afford data for such a study are still going forward, and on account of the unusual extent and bulk of this material, the healing gods of the post-Vedic religions (India, Thibet, China, Japan), and of the Slavs, Teutons, Incas, Mayas and Aztecs, have perforce been omitted from the present volume. Even so, the book very admirably fulfils its author's intention to furnish an essential introduction, or series of prolegomena, to medical history in general. His plan is to give, first, a general survey of the medical mythology and primitive medicine of each civilization, followed by a biographical directory of its several healing gods, arranged in alphabetical order. This arrangement, as also the topical rubrics which paragraph the text, make the book very handy and tractable for reference purposes. Thus under Egypt, we find arresting and informing paragraphs on the trial of the dead, the Book of the Dead (guide-book to the underworld), the life in the tomb, the Sacred Eastern Sky, dreams and oracles, human and divine magic, medical libraries, the medical papyri, the medical incantations, and the liability of the gods themselves to certain diseases; under Babylon, the temple-sleep; under Greece, the chthonian cult, with special lists of medical demigods and heroized persons associated with healing (*Heroi Iatroi*); under Rome, the disease-gods, Angina, Cloacina, Mefitis, Febris and Scabies and lengthy supplemental lists of minor deities and *numina* associated with child-bearing and child-welfare. The account of the Aesculapian cult in Greece and Rome is exhaustive. Greek and Roman mythological names are given in transliterated or literal form, e.g., Asklepios, Kirke, Iason, Iuno, which spelling is carried out with scrupulous consistency. Text and footnotes reveal a most careful and conscientious usage of the available authorities, from Brugsch to Breasted, from Kavvadias to Farnell, but the text might have been vivified here and there by occasional sidelights from such legitimate illustrative material as Ebers' "Uarda," Pater's "Marius the Epicurean," Arnold's "Empedocles," Swinburne's "Erechtheus," the beautiful passage about Asklepios in Browning's "Artemis Prologizes" or the processional of gods in Flaubert's "Tentation." The recent English translation of Rohde's "Psyche," for instance, will add vastly to the interest of the Hellenic phase of medical mythology. It is to be hoped that Dr. Jayne will supplement a study so admirably begun by writing a brief survey of the medical pantheons of the Slavic, Teutonic, post-Vedic, Peruvian and Mexican mythologies. The book is beautifully printed by the Yale Press, the illustrations well chosen, the proof-reading of irreproachable accuracy.

If the author would condense his findings into a primer, for the use of physicians and medical students, similar to Peddie's primer of the incunabula (1913), it would be a helpful and handy *vade mecum*.

F. H. GARRISON, M.D.

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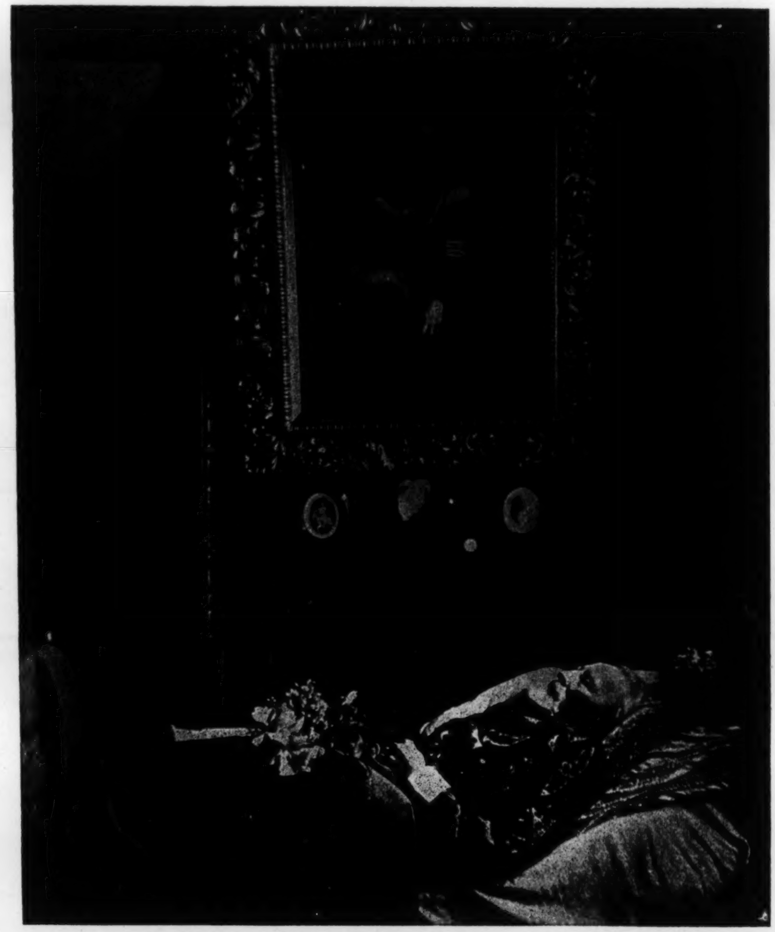

ADOLF KUSSMAUL ON HIS DEATH BED

(*Frontispiece in Dr. Kussmaul's book "Aus Meiner Dozentenzeit in Heidelberg." Edited by Vinzenz Czerny.*)